99 7154
16 Nov 65
RFD

CONFIDENTIAL

Post Office Box 6788
Fort Davis Station
Washington, D. C. 20020
9 November 1965

REGISTERED

25X1A [redacted]

25X1A Attention: [redacted]

25X1A Subject : Contract No. [redacted]

Gentlemen:

This is to advise you that the Contracting Officer has no record of receipt of progress report for the month of June 1965.

Payment for future invoices received from your company will be withheld until receipt of the aforementioned report.

Very truly yours,

[redacted] 25X1A

By
Duly Authorized Representative

Distribution:
Orig - Addressee
2 - NPIC
1 - [redacted]
25X1 25X1A 1 - CAS/[redacted]

25X1 25X1A OL/PD/CASB/CAS [redacted]:mak/[redacted] (5 Nov 65)

Phoned on 16 Nov 65. Rec'd one cy, did you sent one? "No." I will have ours Xerox'd, & send one to you. RFD

25X1A 17 Nov 65 Sent 2 cys of report mailed to [redacted] asked her to forward one to Ofc Eye. RFD

CONFIDENTIAL

SR 997154
NPIC
ADS
RPD
23 Mar 65

CONFIDENTIAL

Post Office Box 8043
Southwest Station
Washington, D. C.

REGISTERED

4 MAR 1965

SS/LB ROUTING 3/9

Ch
D/Ch
BSS
SS
CA /

25X1A

25X1A Attention:

25X1A Subject : Contract No.

Gentlemen:

The following rates are approved for billing purposes:

Overhead	87%
General and Administrative Expense	6%

Very truly yours,

25X1A

By
Duly Authorized Representative

Distribution:
Orig - Addressee
1 - ICAD
1 - Contract file
1 - O/H file
1 - tech/office

25X1 25X1A OL/FD/CB/CSS: :bmm
(3/3/65)

NOTICE

This material contains information affecting the national defense of the United States within the meaning of the espionage laws, Title 18, U.S.C., Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.

CONFIDENTIAL

CONFIDENTIAL

25X1A

NEGOTIATED CONTRACT	CONTRACT/TASK ORDER NO. Contract No. [redacted] 25X1A

ISSUING OFFICE

NAME [redacted] 25X1A	ADDRESS Post Office Box 6788 Fort Davis Station Washington, D. C. 20020

CONTRACTOR

NAME 25X1A [redacted]	ADDRESS [redacted] 25X1A

CONTRACT FOR
Design and fabrication of Special Targets for Interpretation Equipment Evaluation

AMOUNT [redacted] 25X1A

MAIL INVOICES TO

Issuing Office

APPROPRIATION AND OTHER ADMINISTRATIVE DATA

This negotiated contract is entered into pursuant to Statutory Authority and any required determination and findings have been made.

THIS CONTRACT is entered into as of 25 June, 1964, by and between the United States of America, hereinafter called the Government, represented by the Contracting Officer executing this contract and [redacted] 25X1A

(i) a corporation organized and existing under the laws of the State of _____

(ii) a partnership consisting of _____

(iii) an individual trading as _____

hereinafter called the Contractor. The parties hereto agree that the Contractor shall furnish and deliver all the supplies and perform all the services set forth in the attached Schedule, for the consideration stated therein.

NOTICE

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(SCHEDULE) | CONTRACT/TASK ORDER NO. Contract No. [redacted] 25X1A

SCOPE OF WORK:

The Contractor shall design and fabricate Special Targets for Interpretation Equipment Evaluation in accordance with the Contractor's Technical proposal 64-5, "Special Targets for Interpretation Equipment Evaluation", dated 4 February 1964, as amended by the Contractor's letters dated 19 March 1964 and 1 June 1964. Said Proposal and letters are hereby incorporated by reference and made a part hereof.

DELIVERABLE ITEMS:

(1) Three (3) 1040 lines/mm high-contrast targets on glass plates with complete calibration information for each target.

(2) Three (3) 1040 lines/mm high-contrast targets on film with complete calibration information for each target.

(3) Monthly Narrative Reports (five copies) to include:
a. Progress of work to end of period.
b. Problem areas encountered.
c. Projected work for next period.
d. Status of fund expenditures to end of period
3. Confirmation of any verbal committments and/or agreements with the Technical Representatives of the Contracting Officer during the reporting period.

PERIOD OF PERFORMANCE:

The period of performance under this Contract shall be 25 June 1964 through 30 June 1965.

25X1 [redacted]

DELIVERY:

In the event any item under this contract is is personally delivered to the Technical Representative of the Contracting Officer, a signed receipt in duplicate must be obtained from said representative and one copy attached to any invoice submitted for reimbursement for such item(s). Failure to do so will result in suspension of payment, since the Disbursing Officer is prohibited from making payment without evidence of delivery to other than the designated consignee.

25X1A

NAME OF CONTRACTOR [redacted]

NOTICE

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GROUP 1 AND DECLASSIFICATION

FORM 3-58 1412a (12-41)

(SCHEDULE) | CONTRACT/TASK ORDER NO. Contract No. [redacted] | PAGE 2 OF 5 PAGES

25X1A

NON-PUBLICITY:

It is a specific condition of this agreement that the Contractor shall not use or allow to be used any aspect of this agreement for publicity or advertisement purposes. The Contractor may request a waiver of the foregoing but shall not deviate therefrom unless so authorized in writing by the Contracting Officer.

INSPECTION AND ACCEPTANCE:

Acceptance will be at the Contractor's plant subject to full test and inspection by the Technical Representative of the Contracting Officer.

CONTRACT COST:

The Contract target cost shall be [redacted]

25X1A

CONTRACT FEE:

The Contract fee shall be determined as follows:

Contract Target Fee
Contract Maximum Fee [redacted]

25X1A

The Contract target Fee shall be increased in accordance with cost and performance incentives as set forth herein.

A. 80*-20 share of every dollar by which the total contract cost is less than the target cost. (*Government share).

B. Performance Incentives

TARGET

1040 lines/mm (Less than 1040 lines/mm (targets unacceptable)	Contract Target Fee
1168 lines/mm	Contract Target Fee plus two (2) percent of Contract Cost.
1312 lines/mm	Contract Target Fee plus Four (4) percent of Contract Cost.

1150 ✓ 86% of the way from 1040 to 1168.

25X1A

NAME OF CONTRACTOR [redacted]

NOTICE

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FORM 3-58 1412a (12-41)

25X1A

TARGET BAR DENSITY:

The density between bars shall not exceed Twenty (20) percent of bar density. For each Five (5) percent reduction the the inter-bar density below the minimum acceptable Twenty (20) percent that is achieved there, shall be added to the Contract Target Fee One (1) percent of the Contract cost.

Total fee shall be determined in accordance with the attached "Allowable Cost, Incentive Fee and Payment" clause which is incorporated herein by reference and made a part hereof.

25X1A

NAME OF CONTRACTOR [redacted]

(SCHEDULE)

Contract/Task Order No.
Contract No. [redacted]

25X1A

SECURITY

The Items per se are UNCLASSIFIED.

In the event any question may arise during the preliminary phases of the work and/or research concerning the security of the technical aspects i.e., security classification of various component parts and/or related reports connected thereto, the Technical Representative of the Contracting Officer is authorized to furnish security guidance during this interim period.

This is only to be considered an authorized expedient and efficient means of resolving technical security problems by the Technical Representative of the Contracting Officer on the spot and is not to be construed as a waiver of the Contractor's responsibility to request formal written notification and/or authorization from the Contracting Officer prior to effecting any changes in over-all security classification of the contract, or item and/or reports being developed thereunder or the Contractor's Security Requirements, as agreed.

The association of the sponsor with the work being produced under this Task Order is classified CONFIDENTIAL. This classified information and any other classified information which may be specified in the first paragraph of this Security Article, will be divulged only on a need-to-know basis and then only to those who have been authorized in writing by this Government component to have access to classified information.

Correspondence originated by the Contractor and/or other data to be submitted hereunder, the contents of which contain classified information or refer to the number of this Task Order and/or contract or the name and/or address of the Contracting Officer, shall be stamped by you with the classification of CONFIDENTIAL.

REPORTS

A Final Report, manuals, drawings and similar data as may be required under this Task Order, shall be submitted at such time and in such format as may be specified by the Technical Representative of the Contracting Officer or as may be otherwise set forth in the Scope of Work Article of this Schedule. In addition, Technical Progress Reports should be prepared in the manner normally practiced by you and submitted directly to the Contracting Officer's Project Engineer in accordance with the engineer's instructions. A copy of the Progress Report should be mailed directly to the Contracting Officer unless you are advised otherwise.

Name of Contractor

25X1A [redacted]

NOTICE

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CONFIDENTIAL

(SCHEDULE) Contract/Task Order No. Contract No. [redacted] 25X1A

SHIPPING INSTRUCTIONS:

Any items to be delivered under this Task Order shall be delivered FOB Destination to whatever location within the continental limits of the United States as may be later stipulated by the Contracting Officer.

All deliverable items, if any, shall be packaged and crated if applicable, in accordance with the Contractor's best domestic commercial practice or as further amplified by auxiliary specific instructions of the Contracting Officer.

In the event any material or items which may be concerned hereunder are, or may later become SECRET or CONFIDENTIAL and when the size or weight of such material or items classified SECRET or CONFIDENTIAL makes shipment by registered mail impracticable, commercial shipment should be made only by the [redacted] 25X1A [redacted] The material must be securely crated and banded and prior to shipment the contractor shall advise the Contracting Officer of (1) the date the material will be shipped, (2) the approximate date of arrival, and (3) the approximate weight, size, and number of cartons. Bulk shipments of TOP SECRET material shall be made only in accordance with the specific instructions which will be furnished the Contractor by the Contracting Officer upon notification that the material is ready for shipment.

25X1A

INSPECTION:

Inspection during the course of the Task Order as well as the final inspection and acceptance of deliverable products, if any, hereunder shall be made by the technical representative of the Contracting Officer. Final acceptance of items deliverable hereunder, if any, shall be made after proper inspection at the FOB point designated in accordance with the stipulations of "Shipping Instructions" above.

25X1A

Name of Contractor [redacted]

NOTICE

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CONFIDENTIAL

(SIGNATURES)	CONTRACT NO. [ ]

25X1A

The rights and obligations of the parties to this contract shall be subject to and governed by the Schedule and the General Provisions. To the extent of any inconsistency between the Schedule or the General Provisions, and any specifications or other provisions which are made a part of this contract by reference or otherwise, the Schedule and the General Provisions shall control. To the extent of any inconsistency between the Schedule and the General Provisions, the Schedule shall control.

CONTRACTOR REPRESENTS *(Check appropriate boxes)*

(1) (a) That it ☐ is, ☐ is not, a small business concern. For this purpose, a small business concern is a concern that (i) is not dominant in its field of operation and, with its affiliates, employs fewer than 500 employees, or (ii) is certified as a small business concern by the Small Business Administration. (See Code of Fed. Reg., Title 13, Ch. II, Part 103, 21 Fed. Reg. 9709, which contains the detailed definitions and related procedures,) (b) that it ☐ has, ☐ has not, previously been denied a Small Business Certificate by the Small Business Administration, and (c) if Contractor is a regular dealer, it also represents that all supplies to be furnished thereunder ☐ will, ☐ will not, be manufactured or produced in the United States or its Territories or possessions by a small business manufacturer or producer.

(2) (a) That it ☐ has, ☐ has not, employed or retained any company or person (other than a full-time bona fide employee working solely for the Contractor) to solicit or secure this contract; and (b) that it ☐ has, ☐ has not, paid or agreed to pay to any company or person (other than a full-time bona fide employee working solely for the contractor) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract, and agrees to furnish information relating thereto as requested by the Contracting Officer. (Note: For interpretation of the representation, including the term "bona fide employee," see General Services Administration Reg., Title 44, Secs. 150.7 and 150.5(d), Fed. Reg., Dec. 31, 1952, Vol. 17, No. 253.)

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written:

THE UNITED STATES OF AMERICA

By _____

25X1A [ ]

(CONTRACTING OFFICER)

WITNESSES

25X1A [ ]

_____

(CONTRACTOR)

_____ By _____

NOTE.—In case of corporation, witnesses not required but certificate below must be completed. Type or print names under all signatures.

(TITLE)

(ADDRESS)

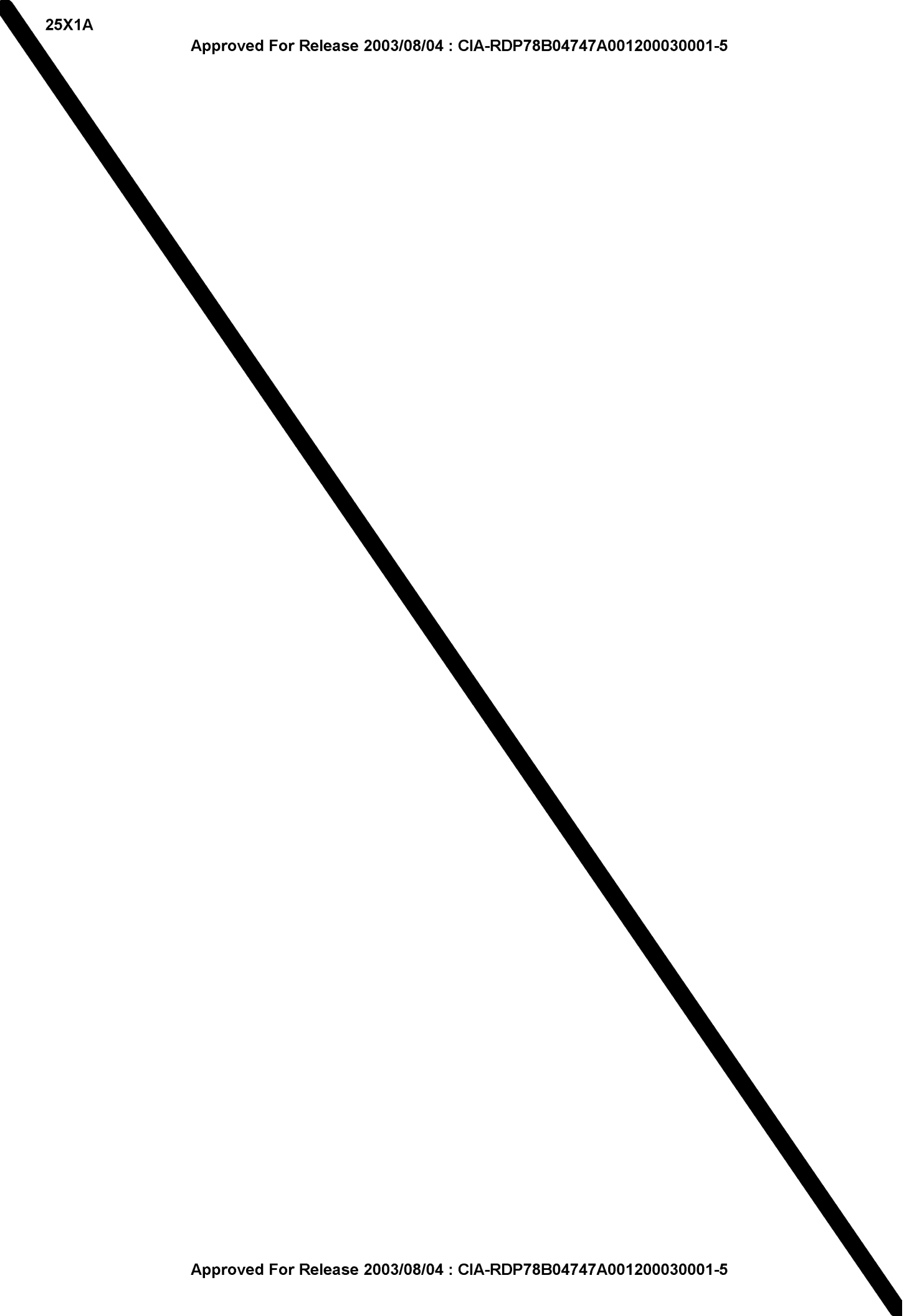
CERTIFICATE

I, _____, certify that I am the _____ of the corporation named as Contractor herein; that _____, who signed this contract on behalf of the Contractor, was then _____ of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

SIGNATURE *(Corporate Seal)*

NOTICE

This material contains information affecting the National Defense of the United States within the meaning of the Espionage Laws, Title 18, U.S.C. Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.



Approved For Release 2003/08/04 : CIA-RDP78B04747A001200030001-5

25X1A [redacted]

25X1A 25X1A

25X1A [redacted] NPIC [redacted] [redacted]

25X1 [redacted] [redacted] 25X1A

4/21/64 5500-2753-64

4155-1030-6000

25X1A 4155-1030-6000

[redacted]

25X1A

Special Targets for Interpretation Equipment Evaluation. 1

Project to yield (6) six targets; 3 each on glass plates and 3 each on film complete with calibration data for each target in accordance with proposal dated 4 Feb. 64 from [redacted]

25X1A

(Proposal recently forwarded to OL/ES.)

Approved by Director, NPIC
23 April, 1964.

CONTRACT INSPECTION REPORT

CONTRACT NO. [ ] TASK NO. -

25X1A

TO:

CONTRACT ADMINISTRATION & SETTLEMENT
BRANCH/PD/OL

DATE: 16 November 1965

INSPECTION REPORT NO. *(If final, so state)*: 12 Final

ESTIMATED COMPLETION DATE: -----

NAME OF CONTRACTOR

[ ] 25X1A

TYPE OF COMMODITY OR SERVICE

Special Resolution Targets

THE CONTRACTOR IS ON SCHEDULE ☐ YES ☒ NO

PER CENT OF WORK COMPLETED - 100%

PER CENT OF FUNDS EXPENDED - 74% as of 30 Apr 65

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS ☒ YES ☐ NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE. ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? ☒ YES ☐ NO *(If yes, give details on reverse side.)*

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? ☐ YES ☒ NO *(If yes, indicate items, quantity, and cost on reverse side.)*

INCENTIVES

IS THIS AN INCENTIVE CONTRACT ☒ YES ☐ NO

IF YES, CHECK TYPE ☐ COST ☒ PERFORMANCE ☐ DELIVERY

NOTE:
USE REVERSE SIDE FOR COMMENTS.
FINAL REPORT MUST CONTAIN INCENTIVE EVALUATION.

OVERALL PERFORMANCE OF CONTRACTOR

1. ☐ OUTSTANDING
2. ☐ EXCELLENT
3. ☐ ABOVE AVERAGE
4. ☒ AVERAGE
5. ☐ BELOW AVERAGE
6. ☐ BARELY ADEQUATE
7. ☐ UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

☐ CONTINUE AS PROGRAMMED

☐ WITHHOLD PAYMENT PENDING SATISFACTORY PERFORMANCE

☒ TERMINATE

☐ OTHER *(Specify)*

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT PUT COMMENTS ON REVERSE IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

ITEM	REC'D	DOES NOT APPLY	ITEM	REC'D	DOES NOT APPLY
PROTOTYPES		X	MANUALS		X
DRAWINGS AND SPECIFICATIONS	X		FINAL REPORT	X	
PRODUCTION AND/OR OTHER END ITEMS	X		SPECIAL TOOLING		X
			OTHER GOVERNMENT PROPERTY		X

DATE OF LAST CONTACT WITH CONTRACTOR: 10 November 1965

SIGNATURE OF INSPECTOR: 25X1A [ ]

DIVISION: 25X1A P&DS

INSPECTOR'S EXTENSION: [ ]

SIGNAT [ ]

25X1A

FORM 10-65 1897 USE PREVIOUS EDITION ☐ UNCLASSIFIED ☒ CONFIDENTIAL ☐ SECRET (12-36)

NARRATIVE REPORT

The final monthly status report (Number 11) was received on 16 November 1965. This report is the last of the deliverable items.

Comments on the Contractor's performance were given on Contract Inspection Report Number 9, Dated 1 July 1965. Since the final monthly report has been received, the Contractor may now be given the final payment.

☐ SECRET ☒ CONFIDENTIAL #99715 ☐ UNCLASSIFIED

CONTRACT INSPECTION REPORT

CONTRACT NO. [ ] TASK NO.

25X1A

TO:

ENGINEERING SECTION/CB/PD/OL

DATE 1 November 1965

INSPECTION REPORT NO. *(If final, so state)* 11

ESTIMATED COMPLETION DATE 30 November 1965

NAME OF CONTRACTOR [ ] 25X1A

TYPE OF COMMODITY OR SERVICE

Special Resolution Targets

THE CONTRACTOR IS ON SCHEDULE ☐ YES ☒ NO

PER CENT OF WORK COMPLETED - 90%

PER CENT OF FUNDS EXPENDED - 74% as of 30 April 65

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS ☒ YES ☐ NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? ☐ YES ☒ NO *(If yes, give details on reverse side.)* See reverse

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? ☐ YES ☒ NO *(If yes, indicate items, quantity, and cost on reverse side.)*

INCENTIVES

IS THIS AN INCENTIVE CONTRACT ☒ YES ☐ NO

IF YES, CHECK TYPE ☐ COST ☒ PERFORMANCE ☐ DELIVERY

NOTE:
USE REVERSE SIDE FOR COMMENTS.
FINAL REPORT MUST CONTAIN INCENTIVE EVALUATION.

OVERALL PERFORMANCE OF CONTRACTOR

1. ☐ OUTSTANDING
2. ☐ EXCELLENT
3. ☐ ABOVE AVERAGE
4. ☒ AVERAGE
5. ☐ BELOW AVERAGE
6. ☐ BARELY ADEQUATE
7. ☐ UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

☐ CONTINUE AS PROGRAMMED

☒ WITHHOLD PAYMENT PENDING final report. ~~SATISFACTORY PERFORMANCE~~

☐ TERMINATE

☐ OTHER *(Specify)*

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT PUT COMMENTS ON REVERSE IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

ITEM	REC'D	DOES NOT APPLY	ITEM	REC'D	DOES NOT APPLY
PROTOTYPES			MANUALS		
DRAWINGS AND SPECIFICATIONS			FINAL REPORT		
PRODUCTION AND/OR OTHER END ITEMS			SPECIAL TOOLING		
			OTHER GOVERNMENT PROPERTY		

DATE OF LAST CONTACT WITH CONTRACTOR 17 September 1965

SIGNATURE OF INSPECTOR [ ] DIVISION 25X1A P&DS

25X1A

INSPECTOR'S EXTENSION [ ] S [ ]

25X1A

FORM 10-64 1897 USE PREVIOUS EDITION ☐ UNCLASSIFIED ☒ CONFIDENTIAL ☐ SECRET (12-36)

NARRATIVE REPORT ☒ INTERIM ☐ FINAL

As of this date, the technical representative has not received the final report, covering the period from 26 May 1965 through 30 June 1965.

25X1A On 17 September 1965, [redacted] stated that he had received his copy about two weeks earlier.

The "Estimated Completion Date" has been pushed ahead in the hope that the Contractor will send the final report before that date.

CONTRACT INSPECTION REPORT

CONTRACT NO. [redacted] TASK NO. 25X1A

TO: ENGINEERING SECTION/CB/PD/OL

DATE: 9 September 1965

INSPECTION REPORT NO. (If final, so state): 10

ESTIMATED COMPLETION DATE: 15 September 1965

NAME OF CONTRACTOR: 25X1A [redacted]

TYPE OF COMMODITY OR SERVICE: Special Resolution Targets

THE CONTRACTOR IS ON SCHEDULE ☐ YES ☒ NO

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS ☒ YES ☐ NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

PER CENT OF WORK COMPLETED - 90%

PER CENT OF FUNDS EXPENDED - 74% as of 30 Apr 65

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? ☐ YES ☒ NO (If yes, give details on reverse side.)

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? ☐ YES ☒ NO (If yes, indicate items, quantity, and cost on reverse side.)

INCENTIVES

IS THIS AN INCENTIVE CONTRACT ☒ YES ☐ NO

IF YES, CHECK TYPE ☐ COST ☒ PERFORMANCE ☐ DELIVERY

NOTE: USE REVERSE SIDE FOR COMMENTS. FINAL REPORT MUST CONTAIN INCENTIVE EVALUATION.

OVERALL PERFORMANCE OF CONTRACTOR

1. ☐ OUTSTANDING
2. ☐ EXCELLENT
3. ☒ ABOVE AVERAGE
4. ☐ AVERAGE
5. ☐ BELOW AVERAGE
6. ☐ BARELY ADEQUATE
7. ☐ UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

☐ CONTINUE AS PROGRAMMED

☒ WITHHOLD PAYMENT PENDING Final Report

☐ TERMINATE

☐ OTHER (Specify)

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT PUT COMMENTS ON REVERSE IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

ITEM	REC'D	DOES NOT APPLY	ITEM	REC'D	DOES NOT APPLY
PROTOTYPES			MANUALS		
DRAWINGS AND SPECIFICATIONS			FINAL REPORT		
PRODUCTION AND/OR OTHER END ITEMS			SPECIAL TOOLING		
			OTHER GOVERNMENT PROPERTY		

DATE OF LAST CONTACT WITH CONTRACTOR: 10 August 1965

SIGNATURE [redacted] DIVISION: P & D S 25X1A

INSPECTOR'S EXTENSION [redacted] SIGNATURE [redacted]

25X1A

FORM 1897 USE PREVIOUS EDITION ☐ UNCLASSIFIED ☒ CONFIDENTIAL ☐ SECRET (12-36)

NARRATIVE REPORT ☒ INTERIM ☐ FINAL

1. The primary purpose of the 10 August 1965 trip to [redacted] 25X1A

25X1A [redacted]

2. While there the Technical Representative discussed their tardiness in submitting a report covering the progress on this contract during the period 26 May - 30 June 1965. Their only excuse was the "end-of-the-fiscal-year" workload. They stated that they would make every effort to complete the draft of the report by the end of the week.

Proj: 997154
29 Jun 65
RTD

CONFIDENTIAL

June 17, 1965

25X1A

[redacted]
Post Office Box 6788
Fort Davis Station
Washington, D. C. 20020

25X1A Subject: Contract No. [redacted]

Gentlemen:

Five (5) copies of progress report for the period of 26 April through 25 May 1965 are forwarded in accordance with the contract schedule paragraph entitled "Deliverable Items."

Sincerely,

25X1A [redacted]

REW/wmt

Encl. a/s

CONFIDENTIAL

65-DC-1032

CONTRACT INSPECTION REPORT

CONTRACT NO. [ ] TASK NO. 25X1A

TO: ENGINEERING SECTION/CB/PD/OL

DATE: 1 July 1965

INSPECTION REPORT NO. *(If final, so state)*: 9

ESTIMATED COMPLETION DATE: 30 June 1965

NAME OF CONTRACTOR 25X1A [ ]

TYPE OF COMMODITY OR SERVICE: Special Resolution Targets

THE CONTRACTOR IS ON SCHEDULE ☐ YES ☒ NO

PER CENT OF WORK COMPLETED - See Reverse

PER CENT OF FUNDS EXPENDED - 71% as of 30 Apr '65

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS ☒ YES ☐ NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? ☒ YES ☐ NO *(If yes, give details on reverse side.)*

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? ☐ YES ☒ NO *(If yes, indicate items, quantity, and cost on reverse side.)*

INCENTIVES

IS THIS AN INCENTIVE CONTRACT ☒ YES ☐ NO

IF YES, CHECK TYPE ☐ COST ☒ PERFORMANCE ☐ DELIVERY

NOTE:
USE REVERSE SIDE FOR COMMENTS.
FINAL REPORT MUST CONTAIN INCENTIVE EVALUATION.

OVERALL PERFORMANCE OF CONTRACTOR

1. ☐ OUTSTANDING
2. ☐ EXCELLENT
3. ☒ ABOVE AVERAGE
4. ☐ AVERAGE
5. ☐ BELOW AVERAGE
6. ☐ BARELY ADEQUATE
7. ☐ UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

☒ CONTINUE AS PROGRAMMED

☐ WITHHOLD PAYMENT PENDING SATISFACTORY PERFORMANCE

☐ TERMINATE

☐ OTHER *(Specify)*

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT PUT COMMENTS ON REVERSE IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

ITEM	REC'D	DOES NOT APPLY	ITEM	REC'D	DOES NOT APPLY
PROTOTYPES			MANUALS		
DRAWINGS AND SPECIFICATIONS			FINAL REPORT		
PRODUCTION AND/OR OTHER END ITEMS			SPECIAL TOOLING		
			OTHER GOVERNMENT PROPERTY		

DATE OF LAST CONTACT WITH CONTRACTOR: 9 June 1965 25X1A

SIGNATURE INSPECTOR [ ] [ ]

DIVISION: P & D S

SIGNATURE OF APPROVER

25X1A

FORM 10-64 1897 USE PREVIOUS EDITION ☐ UNCLASSIFIED ☒ CONFIDENTIAL ☐ SECRET (12-36)

NARRATIVE REPORT ☒ INTERIM ☐ FINAL

1. The following Progress Reports have been received;

a. No. 8, for the period of 25 February through 25 March 1965.
b. No. 9, for the period of 25 March through 25 April 1965.
c. No 10, for the period of 26 April through 25 May 1965.

25X1A 2. The Technical Representative visited the [redacted] on 9 June 1965. The Contractor has produced the three targets on glass plates but has not been able to produce film-base targets which meet the minimum requirements (1040 lines/mm) of the contract.

3. Two of the glass-plate targets, and their accompanying microdensitometer traces and format drawings, were received by the Technical Representative. These two have been examined by the [redacted] stated that by examination of the glass-plate targets and by analysis of the microdensitometer traces, he is convinced that the [redacted] has produced the 1150 lines/mm they claim to have produced. For this reason it is felt that [redacted] has met its commitments as far as delivery of a high-frequency target on glass is concerned.

4. The third glass-plate target, microdensitometer trace and format drawing, were delivered to another individual for evaluation by a different method than used by [redacted] This target is also acceptable to us.

5. The inability of [redacted] to produce acceptable targets on film is felt to be due to limitations imposed by the state-of-the-art in the manufacture of photographic film. It is also felt that [redacted] exerted its "best effort" in an attempt to produce the desired targets on film base.

6. Determination of the exact fee, under the terms of the incentive contract, will have to be done by negotiations, taking into consideration the factors mentioned above.

7. A final inspection report will be submitted after receipt of the 26 May - 30 June 1965 Progress Report from the [redacted]

CONTRACT INSPECTION REPORT

CONTRACT NO. | TASK NO.

25X1A

TO:

ENGINEERING SECTION/CB/PD/OL

DATE: 16 April 1965

INSPECTION REPORT NO. *(If final, so state)*: 8

ESTIMATED COMPLETION DATE: June 1965

NAME OF CONTRACTOR: 25X1A

TYPE OF COMMODITY OR SERVICE: Special Resolution Targets

THE CONTRACTOR IS ON SCHEDULE ☒ YES ☐ NO

PER CENT OF WORK COMPLETED - 45%

PER CENT OF FUNDS EXPENDED - 46% (as of 31 Jan 65)

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS ☒ YES ☐ NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? ☒ YES ☐ NO *(If yes, give details on reverse side.)*

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? See item 1 reverse ☒ YES ☐ NO *(If yes, indicate items, quantity, and cost on reverse side.)*

INCENTIVES

IS THIS AN INCENTIVE CONTRACT ☒ YES ☐ NO

IF YES, CHECK TYPE ☒ COST ☒ PERFORMANCE ☐ DELIVERY

NOTE:
USE REVERSE SIDE FOR COMMENTS.
FINAL REPORT MUST CONTAIN INCENTIVE EVALUATION.

OVERALL PERFORMANCE OF CONTRACTOR

1. ☐ OUTSTANDING
2. ☐ EXCELLENT
3. ☒ ABOVE AVERAGE
4. ☐ AVERAGE
5. ☐ BELOW AVERAGE
6. ☐ BARELY ADEQUATE
7. ☐ UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

☒ CONTINUE AS PROGRAMMED

☐ WITHHOLD PAYMENT PENDING SATISFACTORY PERFORMANCE

☐ TERMINATE

☐ OTHER *(Specify)*

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT PUT COMMENTS ON REVERSE IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

ITEM	REC'D	DOES NOT APPLY	ITEM	REC'D	DOES NOT APPLY
PROTOTYPES			MANUALS		
DRAWINGS AND SPECIFICATIONS			FINAL REPORT		
PRODUCTION AND/OR OTHER END ITEMS			SPECIAL TOOLING		
			OTHER GOVERNMENT PROPERTY		

DATE OF LAST CONTACT WITH CONTRACTOR: 12 April 1965

SIGNATURE OF INSPECTOR: See item 2 reverse 25X1A

DIVISION: PSD3

INSPECTOR'S EXTENSION

SIGNATURE OF APPROVER

25X1A

NARRATIVE REPORT ☐ INTERIM ☐ FINAL

Item 1: Progress report Nr. 7, for the period 26 Jan - 25 Feb 65, was received on 15 April 1965.

Item 2: The Technical Representative visited the Contractor on 12 April 1965.

a. The contractor estimated that, as of 19 March 1965, the contract had a balance of [redacted]. This would mean that, as of 19 March 1965, about 60% of the funds had been expended. 25X1

25X1A b. [redacted] is experiencing difficulty in making targets on film due to irregularities in the thickness of the base. This difficulty has not been experienced to any large degree when working with emulsions coated on glass, as the latter's surfaces are ground and polished prior to coating with emulsions.

25X1A c. The Technical Representative viewed the result of one of the first tests of the "step-and-repeat" target printer that [redacted] has designed. On the test plate, the line pattern for 800 l/mm appeared sharp with good density and sharpness. It would appear that the changes of meeting the requirements of the contract are good.

(997154)

File
7 May 65
RFD

CONFIDENTIAL

April 15, 1965

25X1A [redacted]
Post Office Box 6788
Fort Davis Station
Washington, D.C. 20020

Subject Contract: [redacted] 25X1A

Gentlemen:

Five (5) copies of progress report for the period of February 25 through March 25, 1965 are forwarded in accordance with the contract schedule paragraph entitled "Deliverable Items".

Sincerely yours,

25X1A [redacted]
Director of Administration

REW:cr

Encls. (5)
as stated

CONFIDENTIAL

65-DC-1022-2

25X1A

777 154 for DS file 16 Apr

25X1A

CONFIDENTIAL

March 22, 1965

25X1A

P.O. Box 6788
Fort Davis Station
Washington, D.C. 20020

Subject Contract:

25X1

Gentlemen:

Five (5) copies of progress report for the period of January 26, 1965 through February 25, 1965 are forwarded in accordance with the contract schedule paragraph entitled "Deliverable Items".

Sincerely yours,

25X1A

Director of Administration

REW:cr

Enclosures (5)
as stated

CONFIDENTIAL

65-DC-1017-2

CONTRACT INSPECTION REPORT

CONTRACT NO. | TASK NO.

25X1A

TO:

ENGINEERING SECTION/CB/PD/OL

DATE: 15 March 1965

INSPECTION REPORT NO. *(If final, so state)*: 7

ESTIMATED COMPLETION DATE: Jun 1965

NAME OF CONTRACTOR: 25X1A

TYPE OF COMMODITY OR SERVICE: Special Resolution Targets

THE CONTRACTOR IS ON SCHEDULE ☒ YES ☐ NO

PER CENT OF WORK COMPLETED - 35%

PER CENT OF FUNDS EXPENDED - 30%

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS ☐ YES ☐ NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? ☒ YES ☐ NO *(If yes, give details on reverse side.)* see item 1 on reverse

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? ☐ YES ☒ NO *(If yes, indicate items, quantity, and cost on reverse side.)*

INCENTIVES

IS THIS AN INCENTIVE CONTRACT ☒ YES ☐ NO

IF YES, CHECK TYPE ☒ COST ☒ PERFORMANCE ☐ DELIVERY

NOTE:
USE REVERSE SIDE FOR COMMENTS.
FINAL REPORT MUST CONTAIN INCENTIVE EVALUATION.

OVERALL PERFORMANCE OF CONTRACTOR

1. ☐ OUTSTANDING
2. ☐ EXCELLENT
3. ☒ ABOVE AVERAGE
4. ☐ AVERAGE
5. ☐ BELOW AVERAGE
6. ☐ BARELY ADEQUATE
7. ☐ UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

☒ CONTINUE AS PROGRAMMED

☐ WITHHOLD PAYMENT PENDING SATISFACTORY PERFORMANCE

☐ TERMINATE

☐ OTHER *(Specify)*

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT PUT COMMENTS ON REVERSE IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

ITEM	REC'D	DOES NOT APPLY	ITEM	REC'D	DOES NOT APPLY
PROTOTYPES			MANUALS		
DRAWINGS AND SPECIFICATIONS			FINAL REPORT		
PRODUCTION AND/OR OTHER END ITEMS			SPECIAL TOOLING		
			OTHER GOVERNMENT PROPERTY		

DATE OF LAST CONTACT WITH CONTRACTOR: 6 Jan 65 See item 2 on reverse

SIGNATURE OF INSPECTOR: 25X1A

DIVISION: 25X1A

INSPECTOR'S EXTENSION

SIGNAT

FORM 10-64 1897 USE PREVIOUS EDITION ☐ UNCLASSIFIED ☒ CONFIDENTIAL ☐ SECRET (12-36)

NARRATIVE REPORT ☒ INTERIM ☐ FINAL

Item 1: a. Progress Report Nr. 5, for the period 27 Nov - 25 Dec 1964, was received on 28 Jan. 1965.

b. Progress Report Nr. 6, for the period 25 Dec - 25 Jan 1965, was received on or about 23 Feb. 1965.

25X1A Item 2: The new contract monitor, [redacted] At the NPIC, on 6 January 1965.
25X1A Two planned trips to the [redacted] have been
25X1A cancelled due to the existing workload. Plans are being made to visit the Contractor early in April 1965.

CONFIDENTIAL

February 11, 1965

25X1A

P.O. Box 6788
Fort Davis Station
Washington, D.C. 20020

Subject Contract: 25X1A

Gentlemen:

Five (5) copies of progress report for the period of December 25, 1964 through January 25, 1965 are forwarded in accordance with the contract schedule paragraph entitled "Deliverable Items".

Sincerely yours,

25X1A

Director of Administration

REW/cr

CONFIDENTIAL

65-DC-1011-3

CONTRACT FILE

Proj. No. 997154
28 Jan 65
RPD

CONFIDENTIAL

January 14, 1965

25X1A

[redacted]

Subject Contract: [redacted] 25X1A

Gentlemen:

Five (5) copies of progress report for the period of November 27 through December 25, 1964 are forwarded in accordance with the contract schedule paragraph entitled "Deliverable Items".

Sincerely,

25X1A [redacted]

Director of Administration

REW:cr

Dist:
1 - PD/OL
1 - LB/SS
1 - Contract file DB/PD/DS
1 - Ch, EDLB
1 - Monitor

CONFIDENTIAL

65-DC-1002-3

CONTRACT STATUS REPORT NO. 5

PROJECT JS-411

Period: November 27 through December 25, 1964

January 13, 1965

by

STATINTL

STATINTL

target (whose edge rises with infinite slope) of density 2.5 with a spot whose light distribution was determined by experiments with different sizes of lower slit. The resulting traces are similar to the microdensitometer traces. Future work will check statistically for correlation between real and simulated traces.

PROCESSING EQUIPMENT. Some mechanical difficulties were encountered with the solenoid valves on the spray processor which prevented us from testing the unit during this period. During the period, a rotary valve was added to the processor to switch the drain line. Early in the next period the unit will be operational, and resolution testing of the spray processor will be performed.

EQUIPMENT FOR EXPOSING TARGETS. The lamphouse for the step and repeater is being rebuilt to obtain more even illumination of the target area and closer control of exposure. It will be in operation during the next period.

25X1A

FINANCIAL INFORMATION

a. Total amount authorized

b. Total amount committed through October 31, 1964

c. Total amount committed during November 1964

d. Total amount committed through November 30, 1964

e. Uncommitted balance on November 30, 1964

f. Total hours delivered through November 30, 1964 - 512.4 man-hours.

CONTRACT INSPECTION REPORT

CONTRACT NO. | TASK NO. 5

25X1

TO: ENGINEERING SECTION/CB/PD/OL

DATE: 18 Dec 64

INSPECTION REPORT NO. *(If final, so state)*: 6

ESTIMATED COMPLETION DATE: Jun 65

NAME OF CONTRACTOR: 25X1A

TYPE OF COMMODITY OR SERVICE: Special Resolution Targets

THE CONTRACTOR IS ON SCHEDULE ☒ YES ☐ NO

PER CENT OF WORK COMPLETED - 25%

PER CENT OF FUNDS EXPENDED -

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS ☐ YES ☐ NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? ☒ YES ☐ NO *(If yes, give details on reverse side.)*

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? ☐ YES ☒ NO *(If yes, indicate items, quantity, and cost on reverse side.)*

INCENTIVES

IS THIS AN INCENTIVE CONTRACT ☒ YES ☐ NO

IF YES, CHECK TYPE ☐ COST ☐ PERFORMANCE ☒ DELIVERY

NOTE: USE REVERSE SIDE FOR COMMENTS. FINAL REPORT MUST CONTAIN INCENTIVE EVALUATION.

OVERALL PERFORMANCE OF CONTRACTOR

1. ☐ OUTSTANDING
2. ☐ EXCELLENT
3. ☒ ABOVE AVERAGE
4. ☐ AVERAGE
5. ☐ BELOW AVERAGE
6. ☐ BARELY ADEQUATE
7. ☐ UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

☒ CONTINUE AS PROGRAMMED

☐ WITHHOLD PAYMENT PENDING SATISFACTORY PERFORMANCE

☐ OTHER *(Specify)*

☐ TERMINATE

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT PUT COMMENTS ON REVERSE IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

ITEM	REC'D	DOES NOT APPLY	ITEM	REC'D	DOES NOT APPLY
PROTOTYPES		X	MANUALS		X
DRAWINGS AND SPECIFICATIONS		X	FINAL REPORT		X
PRODUCTION AND/OR OTHER END ITEMS		X	SPECIAL TOOLING		X
			OTHER GOVERNMENT PROPERTY		X

DATE OF LAST CONTACT WITH CONTRACTOR: 16 Dec 64

SIGNATURE OF INSPECTOR: 25X1A

DIVISION: P&DS

INSPECTOR'S EXTENSION

SIGNATURE OF APPROVER

25X1A

NARRATIVE REPORT ☐ INTERIM ☐ FINAL

Work is still progressing on equipment upgrading. The condensor lens of the step-and-repeat printer is being redesigned, with a mixed-gas arc light source and a different light housing. A new master resolution target is on order and a spray processor is in the final phases of development.

Dye image or silver/dye image study is being pursued with experimentation in vacuum coating of emulsions.

25X1A

100x optics are now being purchased for the micro-analyser in order for [redacted] to have a capability to determine the density variation between the bars and spaces of the resolution targets produced.

No conclusion on the incentive evaluation can be given at this time.

An interim report had been received the first week in December on this contract.

25X1A

25X1A

CONTRACT INSPECTION REPORT

TO:

ENGINEERING SECTION/CB/PD/OL

DATE

25 Nov 1964

INSPECTION REPORT NO. *(If final, so state)*

5

ESTIMATED COMPLETION DATE

Jun 65

NAME OF CONTRACTOR

25X1A

TYPE OF COMMODITY OR SERVICE

Special Resolution Targets

THE CONTRACTOR IS ON SCHEDULE

[X] YES [ ] NO

PER CENT OF WORK COMPLETED 22%

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS [X] YES [ ] NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? [ ] YES [X] NO *(If yes, give details on reverse side.)*

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? [ ] YES [X] NO
(If yes, indicate items, quantity, and cost on reverse side.)

OVERALL PERFORMANCE OF CONTRACTOR

1. [ ] OUTSTANDING
2. [ ] EXCELLENT
3. [X] ABOVE AVERAGE
4. [ ] AVERAGE
5. [ ] BELOW AVERAGE
6. [ ] BARELY ADEQUATE
7. [ ] UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

[X] CONTINUE AS PROGRAMMED

[ ] WITHHOLD PAYMENT PENDING SATISFACTORY PERFORMANCE

[ ] TERMINATE

[ ] OTHER *(Specify)*

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT ATTACH COMMENTS IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

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PROTOTYPES			MANUALS		
DRAWINGS AND SPECIFICATIONS			FINAL REPORT		
PRODUCTION AND/OR OTHER END ITEMS			SPECIAL TOOLING		
			OTHER GOVERNMENT PROPERTY		

DATE OF LAST CONTACT WITH CONTRACTOR

20 Oct 64 - Contact to be made in Dec.

SIGN

25X1A

25X1A

DIVISION

P&DS

25X1A

INSPECTOR'S EXTENSION

SIGNATURE OF APPROVER

CONTRACT INSPECTION REPORT

25X1A

TO:

ENGINEERING SECTION/CB/PD/OL

DATE: 1 Nov 64

INSPECTION REPORT NO. *(If final, so state)*: 4

ESTIMATED COMPLETION DATE: Jun 65

NAME OF CONTRACTOR: 25X1A

TYPE OF COMMODITY OR SERVICE: Special Resolution Targets

THE CONTRACTOR IS ON SCHEDULE [X] YES [ ] NO

PER CENT OF WORK COMPLETED: 20%

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS [X] YES [ ] NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? [ ] YES [X] NO *(If yes, give details on reverse side.)*

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? [ ] YES [X] NO
(If yes, indicate items, quantity, and cost on reverse side.)

OVERALL PERFORMANCE OF CONTRACTOR

1. [ ] OUTSTANDING
2. [ ] EXCELLENT
3. [X] ABOVE AVERAGE
4. [ ] AVERAGE
5. [ ] BELOW AVERAGE
6. [ ] BARELY ADEQUATE
7. [ ] UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

[X] CONTINUE AS PROGRAMMED
[ ] WITHHOLD PAYMENT PENDING SATISFACTORY PERFORMANCE
[ ] TERMINATE
[ ] OTHER *(Specify)*

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT ATTACH COMMENTS IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

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PROTOTYPES			MANUALS		
DRAWINGS AND SPECIFICATIONS			FINAL REPORT		
PRODUCTION AND/OR OTHER END ITEMS			SPECIAL TOOLING		
			OTHER GOVERNMENT PROPERTY		

DATE OF LAST CONTACT WITH CONTRACTOR: 20 Oct 64 -R&D progressing.

SIGNATURE: 25X1A

DIVISION: P&DS 25X1A

INSPECTOR'S EXTENSION: 25X1A

SIGNATURE:

CONFIDENTIAL

30 October 1964

MEMORANDUM FOR THE RECORD

SUBJECT: Trip Report for [redacted] 25X1A

25X1A

1. On 20 October 1964, I visited the [redacted] and discussed progress on the contract for the Special Targets for Interpretation Equipment and Evaluation. Up to this point the production of the 260 l/mm and 520 l/mm had been accomplished. The Test and Evaluation Group personnel feel that experiments with new oil emersion Zeiss 40X objectives and dye sensitive emulsions will aid in the production of the 1040 l/mm test targets. Research is continuing in the production of these targets; such as investigating dye techniques to reduce light scattering in the emulsion, modifying the step and repeat printer, matching 649 GH plates in respect to flatness and experimentation with spray processing. Progress to date is satisfactory.

2. An unclassified (white) presentation of the [redacted] 25X1A will be presented at the Pentagon during the week of 8 November 1964. [redacted] personnel will conduct the meeting. 25X1A

3. [redacted] inquired if NPIC would be interested in a presentation of the latest [redacted] capabilities. I was in favor of this and stated that appropriate arrangements would be made if administrative concurrence could be obtained. 25X1A 25X1A

25X1A [redacted]

CONFIDENTIAL

Project 4038

November 3, 1964

25X1A

[redacted]
Post Office Box 6788
Fort Davis Station
Washington, D.C. 20020

25X1 Subject: Contract [redacted]

Gentlemen:

Five (5) copies of progress report for the period of 26 September through 25 October 1964, are forwarded in accordance with the contract schedule paragraph entitled "Deliverable Items."

Sincerely,

25X1A [redacted]

Director of Administration

REW:cr

64-DC-103

CONTRACT INSPECTION REPORT

CONTRACT NO. [redacted] 25X1A

TO:

ENGINEERING SECTION/CB/PD/OL

DATE: 1 Oct 64

INSPECTION REPORT NO. *(If final, so state)*: 3

ESTIMATED COMPLETION DATE: June 1965

NAME OF CONTRACTOR: [redacted] 25X1A

TYPE OF COMMODITY OR SERVICE: Special Resolution Targets

THE CONTRACTOR IS ON SCHEDULE [X] YES [ ] NO

PER CENT OF WORK COMPLETED 10%

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS [X] YES [ ] NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? [ ] YES [X] NO *(If yes, give details on reverse side.)*

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? [ ] YES [X] NO *(If yes, indicate items, quantity, and cost on reverse side.)*

OVERALL PERFORMANCE OF CONTRACTOR

1. [ ] OUTSTANDING
2. [X] EXCELLENT
3. [ ] ABOVE AVERAGE
4. [ ] AVERAGE
5. [ ] BELOW AVERAGE
6. [ ] BARELY ADEQUATE
7. [ ] UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

[X] CONTINUE AS PROGRAMMED

[ ] WITHHOLD PAYMENT PENDING SATISFACTORY PERFORMANCE

[ ] TERMINATE

[ ] OTHER *(Specify)*

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT ATTACH COMMENTS IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

ITEM	REC'D	DOES NOT APPLY	ITEM	REC'D	DOES NOT APPLY
PROTOTYPES			MANUALS		
DRAWINGS AND SPECIFICATIONS			FINAL REPORT		
PRODUCTION AND/OR OTHER END ITEMS			SPECIAL TOOLING		
			OTHER GOVERNMENT PROPERTY		

DATE OF LAST CONTACT WITH CONTRACTOR: Since only R&D efforts are being pursued it was not necessary to contact this company. Earliest planned trip is latter part of October.

SIG [redacted] 25X1A

DIVISION: P&DS 25X1A

INSPECTOR'S EXTENSION [redacted]

SI [redacted]

25X1A

GROUP 1
Excluded from automatic downgrading and declassification

CONTRACT INSPECTION REPORT

CONTRACT NO. [redacted] 25X1A

TO: ENGINEERING SECTION/CB/PD/OL

DATE: 29 Aug 64

INSPECTION REPORT NO. (If final, so state): 2

ESTIMATED COMPLETION DATE: June 1965

NAME OF CONTRACTOR [redacted] 25X1A

TYPE OF COMMODITY OR SERVICE: Special Targets

THE CONTRACTOR IS ON SCHEDULE [X] YES [ ] NO

PER CENT OF WORK COMPLETED 7%

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS [X] YES [ ] NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? [ ] YES [X] NO *(If yes, give details on reverse side.)*

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? [ ] YES [X] NO *(If yes, indicate items, quantity, and cost on reverse side.)*

OVERALL PERFORMANCE OF CONTRACTOR

1. [ ] OUTSTANDING
2. [X] EXCELLENT
3. [ ] ABOVE AVERAGE
4. [ ] AVERAGE
5. [ ] BELOW AVERAGE
6. [ ] BARELY ADEQUATE
7. [ ] UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

[X] CONTINUE AS PROGRAMMED

[ ] WITHHOLD PAYMENT PENDING SATISFACTORY PERFORMANCE

[ ] TERMINATE

[ ] OTHER *(Specify)*

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT ATTACH COMMENTS IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

ITEM	REC'D	DOES NOT APPLY	ITEM	REC'D	DOES NOT APPLY
PROTOTYPES			MANUALS		
DRAWINGS AND SPECIFICATIONS			FINAL REPORT		
PRODUCTION AND/OR OTHER END ITEMS			SPECIAL TOOLING		
			OTHER GOVERNMENT PROPERTY		

DATE OF LAST CONTACT WITH CONTRACTOR: None 25X1A

SIGN [redacted]

DIVISION: P&DS 25X1A

INSPECTOR'S EXTENSION [redacted]

25X1A

Contact will be made with this company during the early part of October. R&D efforts are now being pursued to establish procedures for production of these targets. No travel is therefore planned until October.

ILLEGIB

CONTRACT INSPECTION REPORT

25X1A

TO:

ENGINEERING SECTION/CB/PD/OL

DATE: 28 July 1964

INSPECTION REPORT NO. *(If final, so state)*: 1

ESTIMATED COMPLETION DATE: 30 June 1965

NAME OF CONTRACTOR: 25X1A

TYPE OF COMMODITY OR SERVICE: Special Targets

THE CONTRACTOR IS ON SCHEDULE [X] YES [ ] NO

PER CENT OF WORK COMPLETED: 5%

THE CONTRACTOR WILL PROBABLY REMAIN WITHIN ALLOCATED FUNDS [X] YES [ ] NO IF ANSWER IS "NO" ADVISE RECOMMENDATION AND/OR ACTION OF SPONSORING OFFICE, ON REVERSE HEREOF. IF KNOWN, INDICATE MAGNITUDE OF ADDITIONAL FUNDS INVOLVED.

HAS AN INTERIM REPORT, FINAL REPORT, PROTOTYPE, OR OTHER END ITEM BEEN RECEIVED FROM THE CONTRACTOR DURING THE PERIOD? [ ] YES [X] NO *(If yes, give details on reverse side.)*

HAS GOVERNMENT-OWNED PROPERTY BEEN DELIVERED TO CONTRACTOR DURING THIS PERIOD? [ ] YES [X] NO *(If yes, indicate items, quantity, and cost on reverse side.)*

OVERALL PERFORMANCE OF CONTRACTOR

1. [ ] OUTSTANDING
2. [X] EXCELLENT
3. [ ] ABOVE AVERAGE
4. [ ] AVERAGE
5. [ ] BELOW AVERAGE
6. [ ] BARELY ADEQUATE
7. [ ] UNSATISFACTORY

IF OVERALL PERFORMANCE OF CONTRACTOR IS UNSATISFACTORY OR BARELY ADEQUATE, INDICATE REASONS ON REVERSE SIDE.

RECOMMENDED ACTION

[X] CONTINUE AS PROGRAMMED

[ ] WITHHOLD PAYMENT PENDING SATISFACTORY PERFORMANCE

[ ] TERMINATE

[ ] OTHER *(Specify)*

IF TERMINATION IS RECOMMENDED OR IF THIS IS A FINAL REPORT ATTACH COMMENTS IN NARRATIVE FORM ON CONTRACTOR'S PERFORMANCE AND CERTIFY THAT ALL DELIVERABLE ITEMS UNDER THE CONTRACT HAVE BEEN RECEIVED. THESE INCLUDE, WHERE APPLICABLE, THE FOLLOWING:

ITEM	REC'D	DOES NOT APPLY	ITEM	REC'D	DOES NOT APPLY
PROTOTYPES			MANUALS		
DRAWINGS AND SPECIFICATIONS			FINAL REPORT		
PRODUCTION AND/OR OTHER END ITEMS			SPECIAL TOOLING		
			OTHER GOVERNMENT PROPERTY		

DATE OF LAST CONTACT WITH CONTRACTOR: None as yet

SIGNATURE OF INSPECTOR: 25X1A

DIVISION: PD/DS

INSPECTOR'S EXTENSION: 25X1A

SIGNATURE OF APPROVER

It is expected that contact with this company will be made in August. Work has been underway since 25 June 1964 and no problems are anticipated.

STATINTL

STATINTL

memo

[redacted]

Rec'd 16 Nov 65 RHD

I'm the culprit. I had this thing stuck away and forgot it.

[redacted]

STATINTL

STATINTL

[redacted]

#99 7154
Tech Rep Cy

CONTRACT STATUS REPORT NO. 11

PROJECT JS-411

Period: May 26 through June 30, 1965

by

STATINTL

[redacted]

STATINTL

[redacted]

CONTRACT STATUS REPORT NO. 11

PROJECT JS-411

TARGET WORK

During the last period of this contract we produced three L targets, containing elements 4-3 (20.2 lines/mm) through 10-2 (1150 lines/mm). These high contrast targets were calibrated on the microdensitometer using the smallest available microspot, and a narrow lower slit ahead of the photomultiplier tube. In this tracing mode, the effective spot size is under one micron.

Two of these targets were delivered to [redacted] with the calibration traces. The third target was sent to [redacted] STATINTL with the calibration trace.

MICRODENSITOMETER RESEARCH

During this period the rough draft of the microdensitometer report was completed. However, it was not completed in time for publication under this contract. As soon as the report is published, copies will be forwarded.

This report covers the work done to determine the light distribution of the 1.1 micron diameter microspot. After determining the light distribution, computer programs were written to simulate the tracing operation on the microdensitometer. Simulated traces of perfect edges were made using ideal light distributions. Conclusions were reached based on the work to date, and the direction of future work was outlined.

FILM TARGET

No targets on film were produced on this contract, due to the lack of time available to solve the problems associated with production of film targets. Some of the problems include a means of holding the film flat while exposing, a means of holding the film during processing, and testing of film to determine if it has acceptable flatness.

A vacuum platen for holding the film during exposure was designed, and the rough machining done on the inchanite blank. A price quotation on the finish machining was obtained from [redacted] STATINTL

No investigation was made to determine if stock film is sufficiently flat to maintain focus while exposing 1000 line targets. Past work concerning film targets indicated

occasional bumps in the emulsion. Minute pockets of trapped air between the vacuum platen and the film also gave trouble.

PROJECT HISTORY

In order to set up to produce and calibrate high line frequency targets it was neccessary to upgrade each step, i.e., holding the glass plates, positioning the plates during exposure, focusing aids, exposure control, processing, and microdensitometer calibration, in the target production process.

A spray processor was built as part of another target contract, and sensitometrically tested under this contract. Descriptions of testing appear in previous progress reports. The spray processor enabled us to process to a high gamma, with moderate grain and low base plus fog. Close control of speed point was achieved.

With high gamma processing, the contrast of the aerial image produced by the printing lens is enhanced. The delivered targets were processed for 20 minutes, in D-19, 73° F. A dilute bleach solution was sprayed for 15 seconds to reduce base plus fog, and increase gamma to about 12.0.

STATINTL A [redacted] Photorepeater was used to print the targets. The Photorepeater is similar in operation to a standard condenser enlarger. A light source is focused with condenser lenses on a negative, and a reduced image of the negative is projected onto the film or plate. The plate rests on a table, which can be accurately positioned in two dimensions. High quality ruled glass masters of three bar elements were

ILLEGIB reduced by 36.5 to 1 by means of a [redacted] 40X microscope objective, 1.0 n.a., oil immersion. The elements at low line frequencies are printed one at a time, with the photographic plate moved in X and Y to properly position the elements on the plate. The elements at high line frequencies are printed two, three or six at a time.

The microscope lens is accurately focused by a gauge which directly measures the lens to emulsion distance. The gauge is a noncontact, air operated type, and is calibrated in 10 microinch increments. The sensing element is clamped onto the side of the microscope objective. Lens to emulsion distance can be held to within 20 micro-inches in our setup, which is adequate for printing 1000 line per millimeter.

The lamphouse consists of a point light source arc lamp, a solenoid actuated shutter, and a pair of miniscus condenser lenses. The intensity of the lamp is held constant by

using a photocell to sample the light, and control the power input to the lamp to maintain constant intensity (within 1%). An accurate clock timer controls the shutter to regulate the exposure. A Wratten 45 filter in the light path gives narrow band blue light, and neutral denisty filters adjust the exposure times to reasonable values. (typically 5-20 seconds).

The Photorepeater rests on a shock mounted table, in a clean room area.

The targets were made on Kodak microflat glass plates, coated with 649-GH high resolution emulsion. The glass plates, 1/4 inch thick, are flat to 20 microinches per linear inch. With these plates there was no problem in maintaining focus. A small amount of time was spent on research into vacuum coating ultra-thin emulsions. This type of emulsion will be necessary for high quality master targets over 1150 lines per millimeter.

In the execution of this contract we were able to upgrade each step in the production process sufficiently to produce 1150 lines per millimeter targets on glass plates. Some tests were conducted printing higher lines frequencies, and it was found that the system could just resolve 1400 to 1600 lines per millimeter. Exposure is a problem, due to the response fall off of the lens emulsion combination.

All of the bars in the target are the same length. At the high line frequencies it is difficult to obtain a focus position where the entire length of the bars are in focus. The spherical curvature of the points of best focus is very evident. If a constant aspect ratio target were made, better quality lines would result.

CONTRACT STATUS REPORT NO. 10

PROJECT JS-411

Period: April 26 through May 25, 1965

by

STATINTL

STATINTL

CONTRACT STATUS REPORT NO. 10

PROJECT JS-411

SPRAY PROCESSOR

During the past month, two changes were made in the spray processor system. First, a temperature control system was built for the developer tank. With this controller, we are able to hold the developer to ± 0.2° F or better. Secondly, the concentration of the bleach solution was reduced, in order to reduce the amount of bleaching. These two changes brought the processing into closer control.

DIAL SETTING PROGRAM

A FORTRAN program for the IBM 1620 computer was written some time ago to calculate the dial settings required on the Step and Repeater, in order to position the plate properly under the lens for each exposure. The first input to the program is a complete set of measurements on each three bar or composite master. The computer uses these data to calculate the center line distance for each master. Next, the starting coordinates of the first element are entered. These are followed by a set of cards describing the group and element numbers to be exposed and the center-to-center distances between elements. The calculated dial settings compensate for mounting errors of the masters, so that the target elements will have perfect spacing.

The program was run for the 1000 line target, and a test target was made with the output program. The test plate was accurately measured, and there were some minor spacing problems. The input cards were corrected, and the dial setting program was rerun.

STEP AND REPEATER

The Step and Repeater lamphouse and optical system were disassembled and throughly cleaned up in preparation for making targets.

MICRO-SPOT RESEARCH

During this period, we started writing the Micro-Spot research report. It will be finished during the next period.

TARGET WORK

During the next period we plan to make three 1000-line L targets on 2 x 2-1/4 inch glass plates. These will be traced with the smallest spot presently available.

25X1A

FINANCIAL INFORMATION

a.	Total amount authorized	
b.	Total amount committed through March 31, 1965	
c.	Total amount committed during April 1965	
d.	Total amount committed through April 30, 1965	
e.	Uncommitted balance on April 30, 1965	
f.	Total hours delivered	

MPR-65-91

Tech Rep Copy

CONTRACT STATUS REPORT NO. 9

PROJECT JS-411

Period: March 26 through April 25, 1965

by

STATINTL

[redacted]

STATINTL

[redacted]

CONTRACT STATUS REPORT NO. 9

PROJECT JS-411

EQUIPMENT FOR EXPOSING TARGETS

The correct positions of the aperture plate in X, Y, and Z directions in the lamphouse were determined, and a few focus-exposure tests were made. For these tests we used a composite master which has one complete group on it, that is, six 3-bar elements. With the present reduction ratio, this master yields 9-3 through 10-2. The best focus-exposure combination gave only poor quality at 1000 lines per millimeter, and the target was not resolved at 1140 lines/mm. The aperture plate used had a 1/8-inch diameter hole.

Since there is adequate light available from the lamp being used, another aperture plate was made with a 1/16-inch diameter hole. Micrometer heads were mounted on the lamphouse to position this plate in the X and Y directions. With this new arrangement, test exposures showed that performance had definitely improved. The targets were now resolved to 1150 lines/mm.

To obtain even greater improvement in the quality of the targets, the lamphouse was further modified to use the 25 watt Sylvania arc lamp without any diffusion or aperture plate. This lamp has a 0.030-inch mean diameter light spot, which is quite small. The lamp assembly tube was shortened to compensate for the vertical distance between the arc and the aperture plate. The micrometer heads were moved to the base of the lamp, to position it in the X and Y directions. The lamphouse was adjusted in X, Y, and Z directions and some focus-exposure tests were run. As expected, the quality of the images improved once more. The lines are a little ragged at the high end, but usable.

All test plates have been processed in the spray processor, with 20 minutes development time at 68° F in Kodak D-19 developer. A high processing gamma, typically 20, is obtained. Consequently, exposure is very critical. The target image goes from under exposed to over exposed with a 0.15 change in relative Log E. The focus must be held within limits of +0, -50 micro-inches. With care in setting up, focus and exposure can be held to these limits.

The images obtained are rather dirty, due to dirt in the optical system. The problem is accentuated by the use of a point light source. After completion of testing, the entire system will be cleaned up before making the targets.

MICRO-SPOT RESEARCH

Simulation of Micro-Spot tracing has been resumed, and the results look very encouraging. We rewrote the program, so that the input data now state the relative intensity of the spot as a function of distance (one dimensional view). Several light distributions were tried. Some of them gave very good edge traces. In these simulated tracings, the chrome edge was assumed to have vertical rise from zero density to 2.0 density. The light distribution of the spot was assumed to be symmetrical. The diffraction which occurs at a sharp edge was neglected; consequently, the traces that were produced will not be exactly the same as those obtained on the machine.

Chrome edge traces have been made with a 100x Zeiss oil immersion lens of 1.32 n.a., but the traces were not evaluated. This will be done during the next month.

SPRAY PROCESSOR

Plates processed in the spray processor with D-19 for 20 minutes had a sepia stain. The nature of the stain and the steps taken to remove it are covered in a separate, attached report by [redacted] STATINTL

WORK PLANNED FOR NEXT PERIOD

During the next period we plan to make three targets on glass plates, 2 x 2 x 1/4 inch. Exposure, focus and processing techniques used will be as described above.

During the next report period, the results of the Micro-Spot research work will be completely summarized in a report.

25X1A

FINANCIAL INFORMATION

Total Amount Authorized	
Total Amount Committed through 28 February 1965	
Total Amount Committed during March 1965	
Total Amount Committed through 31 March 1965.	
Uncommitted Balance on 31 March 1965	
Total man-hours delivered through 31 March 1965	

25X1A

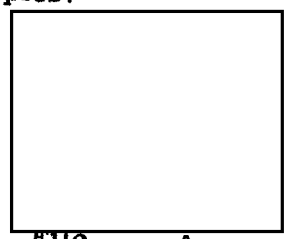
TECHNICAL REPORT

"L" TARGETS

THE USE OF POTASSIUM FERRICYANIDE FOR ADDENDA PROCESSING OF HIGH CONTRAST TARGETS

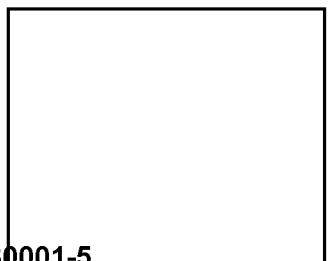
STATINTL

Copies:



File

STATINTL



PREFACE

The work outlined by this report was performed in an attempt to solve problems occurring during processing of 'L' Targets in [redacted] Plate Spray Processor. Accelerated processing conditions resulted in chemical stain and emulsion surface abrasions. Chemical scouting work was carried out to reduce these defects while still maintaining high photographic response from the film-developer-processing system. The results and inferences drawn are for the most part subjective, indicating areas for further study and investigation. General hypothesis and reaction mechanisms are formulated to give working models which explain the chemical reactions and photographic results obtained and are in no way intended to be concrete systems.

STAT

EMULSION STAINS

I Descriptive, Nature and Cause

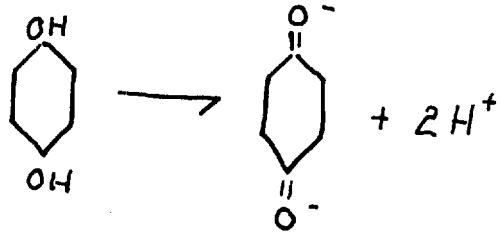
The spray processor used for processing Data's 'L' Targets had some inherent chemical drawbacks. Increased base + fog and a yellow brown stain occurred when [ ] High Resolution Plates (HRP) were processed for prolonged development times and/or high temperatures* in [ ] developer formula D-19. However, these defects were considered secondary to the preliminary investigation of the spray processor. The plates used for testing the processor prior to use on a production basis had thinner emulsion coatings than those used in the preliminary tests. The newer, thinner, emulsion coatings, when processed as before at optimum time and temperature conditions, resulted in a much higher level of stain than did the previous HRP's.

When the high level of stain was first encountered, systems contamination was thought to exist due to the color and increase of stain over the previous level observed. All components of the processor were cleaned with a solution of sodium hydroxide in isopropyl alcohol and then neutralized by a 50% nitric acid solution. (The acid wash was required to neutralize the hydroxide as well as passivate the stainless steel in the system.) The only metal surfaces in contact with processing solutions were the 303 stainless steel valve chambers and the 316 stainless steel in line strainer and spray nozzle. Inspection of the metal surfaces showed no apparent signs of corrosion as might be expected from the use of ammonium salts in the fixer. (See appendix for Rapid Fixer Formula)

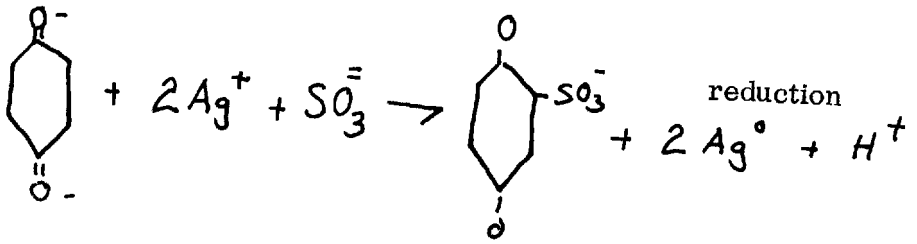
*See Part II of Technical Report
'T' Targets - A Spray Processor

One plausible cause of our stain could have been contamination of the developer from the fixer. A reaction of the ammonium argenthiosulfate with the metal surfaces could produce a complex metallic salt which would be soluble in a basic solution such as the developer. Our hypothesis then being that a reaction between this complex and the hydroquinone developing agent would produce a quinone or silver sulfide stain.

A test was run to determine the nature and probable cause of the stain. A developer using the tetra-sodium salt of ethylenediaminetetraacetic acid (EDTA) in conjunction with ferrous sulfate[1] was used to process a HRP for twenty minutes of development at 75° F. A stain of slightly different appearance, although most assuredly the same type, still existed. If no stain had resulted from this test it could be inferred that the stain was definitely a quinone oxidation product. However, the positive results tended to give support to the possibility of a silver sulfide stain. If we assume our stain to be silver sulfide, a mechanism for the chemical reaction must be formulated. STATINTL [redacted] has proposed the following reaction between hydroquinone and silver halide:[2]



Hydroquinone ionization (1)



reduction (2)

Three hydrogen ions are liberated in the process. Under normal conditions, these combine with the hydroxyl ions, present from the alkali and buffer, to form water. Perhaps, under accelerated and prolonged development times, a reaction could occur between sulfite or sulfate and the hydrogen ions. Assuming free hydrogen ions are being liberated faster than the buffered system can react to them, the following reaction could possibly occur:

$$SO_3^{=} + 3H^{+} \longrightarrow 1\tfrac{1}{2}\,HOH + S^{=} \qquad (3)$$

Since silver sulfide ions are highly insoluble, they would precipitate forming a silver sulfide stain:

$$S^{=} + 2Ag^{+} \longrightarrow Ag_2S\downarrow \qquad (4)$$

In order for this reaction mechanism to be feasible, the enthalpies of formation must favor the thermodynamics of the system. Thus the two competing reactions are:

$$H^{+} + OH^{-} \rightleftarrows HOH_{(liq)} \qquad (5)$$

and

$$SO_3^{=} + 6H^{+} \longrightarrow S^{=} + HOH_{(liq)} \qquad (6)$$

The differential heats of formation in terms of $\Delta\bar{H}^{o}_{f}$ are as follows:[3]

Equation (5)

State	Heat of Formation in Kcal/mole $A\bar{H}^{o}_{f}$
$HOH_{(\ell)}$	-68.317
H^{+}	0.0
OH^{-}	-54.957
	-13.360 Kcal/mole

Equation (6)

State	Heat of Formation in Kcal/mole ΔH^{o}_{f}
	10.0
S^{--}	(-68.317) X 3
$HOH_{(1)}$	-196.951
	-148.58
SO^{--}	(0.0) X 6
H^{+3}	-148.58

-196.951
-148.58 Subtract
- 48.371 Kcal/mole

Since both reactions require heat, the mechanism requiring the lesser amount will react more favorably. Thus, the possibility of the formation of silver sulfide by oxdized developing agent does not appear to be thermodynamically favorable. Although silver sulfide is easily formed in fixers, this appears to be due to the lower stability of the thiosulfate ion as compared to the sulfite ion. Hence, the stain appears to be an oxidized developing agent.

Increasing the sulfite concentration as high as 130% of the published D-19 formula failed to retard the formation of the stain as would be expected if it were a quinone stain formed from aerial oxidation or chemical oxidation of hydroquinone. (See equation #2) Apparently the stain observed on the plate processed in EDTA was an oxidized ferrous-EDTA complex. Its formation mechanism being similar to that of oxidized hydroquinone. Since both developing agents investigated, hydroquinone and EDTA, form free radical groups upon ionization, the possibility of a gelatin-oxidized phenyl complex is possible.

Assuming our stain to be a quinone complex or similar oxidized developing agent, we still do not know the cause or reaction mechanism. Since the stain still persisted after the vigorous cleaning previously described, it was felt that con-

tamination, at least as stated in the hypothesis, was not the cause of the stain. The stain can only be attributed to an interaction of the entropy of the system with the thermodynamics of the developer ions and molecules.

II Methods of Elimination

Assuming the stain to be an oxidation product complexed with the heterocyclic gelatin chains, a method of removing the stain was needed. The use of a reducing agent appeared to be the best method. A concentrated solution of oxalic acid was tried, but failed to bleach the stain. Nor did 45 grams per liter of citric acid in the fixer reduce the stain. Other reducers such as cerate or permanganate could be used to reduce the stain; however, they have an adverse effect upon the silver image and/or gelatin. A one molar solution of potassium ferricyanide was used in conjunction with 200 grams per liter solution of potassium thiosulfate (penta-hydrate) to remove the stain. The use of this type of reducer also had sensitometric advantages. Acting as a cutting reducer, the toe portion of the D Log E curve would effectively be reduced more than the shoulder or straight line portion. Incorporation of the reducer into the spray processor cycle became desirable at this time.

Mixing the ferricyanide solution in the stop bath, as an attempt to include the stain removal technique in the processor, had two disadvantages:

a) The ferricyanide complexed with the sodium formaldehyde bisulfite to give a green colored formic-cyanide which would stain the gelatin:

b) The strongly buffered alkaline developer solution oxidized the reducer before it was able to react with the stain. Thus the reducer could not be included in the present stop-bath formula. Including the reducer in the Rapid Fixer would likewise present oxidation problems. Hence, it was decided to have the

stain removal step as a separate operation, drawing both reducing solution and formula fixer into the valve manifold simultaneously, following fixation of the plates.

The rapid fixer formulated for use in the spray processor used ammonium and formaldehyde salts. (See appendix for solution formulas) As previously noted formaldehyde has an unfavorable reaction with ferricyanide ions. The ammonium salts are weak bases and act much as the developer in oxidizing the reducer solution. The fixer formula was revised so as to be compatible with the ferricyanide in acting as a cutting reducer. A non-hardening fixer formula resulted and was acceptable since the plates are hardened in the stop bath thus reducing wash time. (See appendix for revised fixer formula) A decthnormal ferricyanide solution was used to reduce the plates in the presence of a two normal fixer solution.

III Sensitometric Effect of the Cutting Reducer

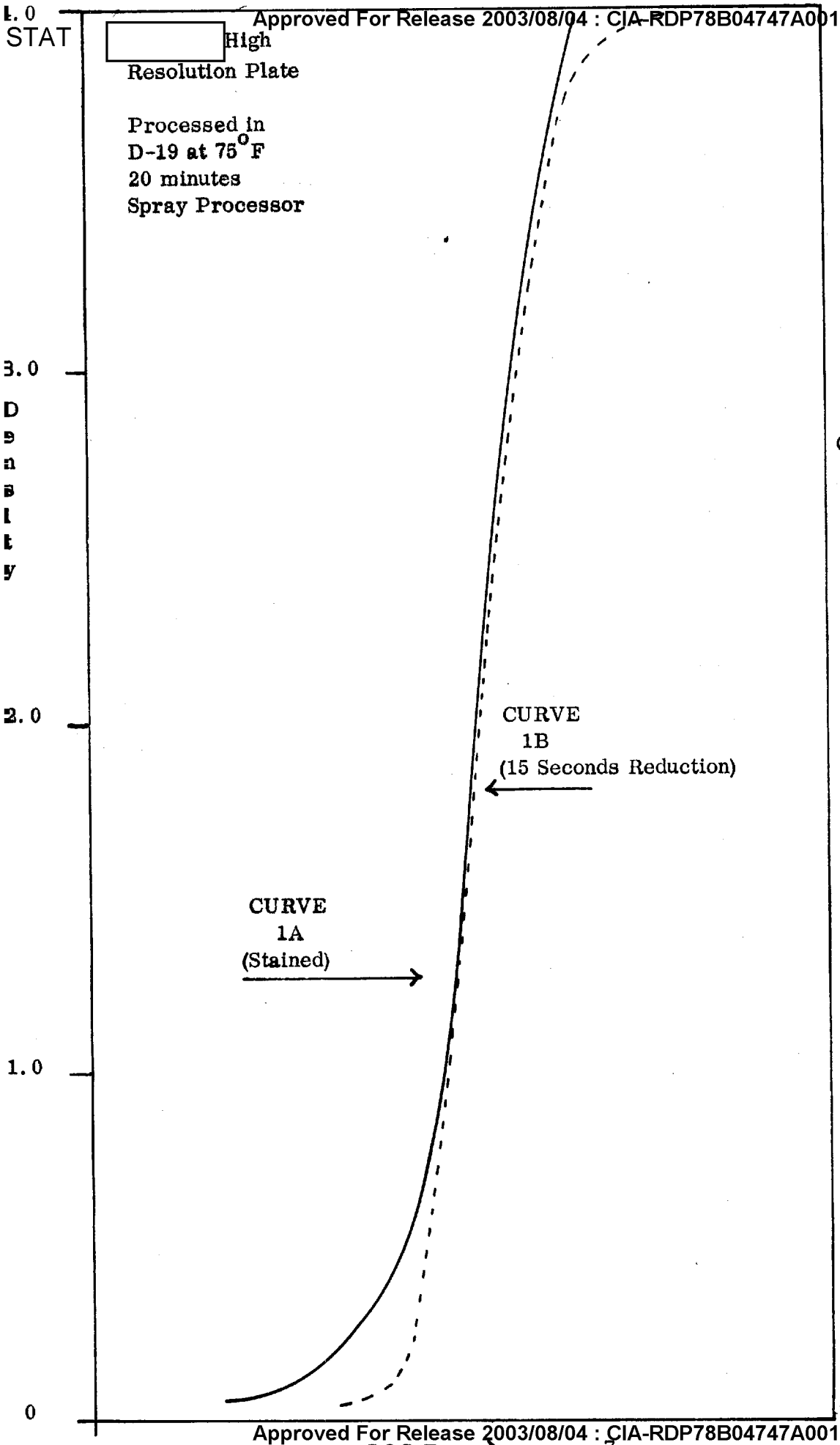
Curve 1A represents a HRP processed for twenty (20) minutes in D-19 without any image reduction. Curve 1B shows a similar plate processed, but reduced for 15 seconds in a decthnormal solution of potassium ferricyanide and two normal thiosulfate solutions combined in a ratio of 1:1. As can be seen the use of the reducer solution reduced the stain and increased gamma. Unfortunately, with the removal of the stain abrasions to the emulsion surface were detected. These did not necessarily appear with the inclusion of the reducer to the process; since they were only apparent with prolonged development time.

The abrasions consisted of small pits uniformly distributed over the emulsion surface of the plate. The abrasions were attributed to the droplets of solution being

STAT [redacted] High Resolution Plate

Processed in
D-19 at 75°F
20 minutes
Spray Processor

	Curve 1A	Curve 1B
B + F	0.06	0.05
1.	0.07	0.05
2.	0.08	0.05
3.	0.09	0.05
4.	0.12	0.05
5.	0.21	0.05
6.	0.40	0.05
7.	0.72	0.23
8.	1.46	1.02
9.	2.38	2.46
10.	3.04	3.12
11.	3.40	3.92
12.	3.75	4.00
13.	4.00+	4.00+
Speed	7.3	7.7
Gamma	15.0	19.0



sprayed at high velocities on an unhardened emulsion. Before the introduction of the reducer, the plates were presprayed with water making the surface more compressible. In order to minimize the abrasions, a pre-hardener bath, similar to that used in the K-12 Kodachrome process was employed. The plates were immersed in the bath for five minutes and developed for twenty minutes. The loss in sensitivity was of the order of 2.0 log E units. Bathing the plate for one minute in the pre-hardener, followed by a three minute water bath and developed for twenty minutes at 75°F. resulted in curve 2A and the elimination of the abrasions. Comparison of curve 2A with 1B shows a speed loss as well as a loss in gamma. Diluting the pre-hardener to a 10% solution restored some of the original speed and gamma. (See curve 2B) The process of pre hardening had the disadvantage of being dependent upon time and temperature which are hard to control in a manual process. Tests were run using the reducer on HRP processed for five minutes, even though no stain problem existed.

Curves 3A and 3B show the difference between non-reduced and reduced plates which had been developed for five minutes in D-19 at 75°F. The plate which was reduced for 15 seconds (curve 3B) indicates an increase in gamma of 140% NO! 40% increase associated with a loss in speed of 0.17 log E units and a lower Dmax, over the plate which was not reduced. The gamma is 75% of that obtained for twenty minutes of processing and 15 seconds of reduction; with a loss in speed of 0.33 Log E units. The latter plate showed no apparent loss in Dmax with reduction. Very interestingly the curve 3B exhibits the effect of two types of reduction.

STAT [redacted] High Resolution Plates

Processed in
D-19 at 75°F
for 20 min.
15 sec. reduction

	Curve 2A	Curve 2B
1.	0.05	0.05
2.	0.05	0.05
3.	0.05	0.05
4.	0.05	0.05
5.	0.06	0.05
6.	0.09	0.07
7.	0.13	0.21
8.	0.23	0.38
9.	0.44	0.90
10.	0.94	1.65
11.	1.73	2.91
12.	2.72	3.56
13.	3.76	3.95
14.	3.98	4.00+
15.	4.00	
16	4.00+	
Speed	9.6	8.1
Gamma	12.5	15.6

4.00

3.00

D
e
n
s
i
t
y

CURVE 1B
Without Prehardener

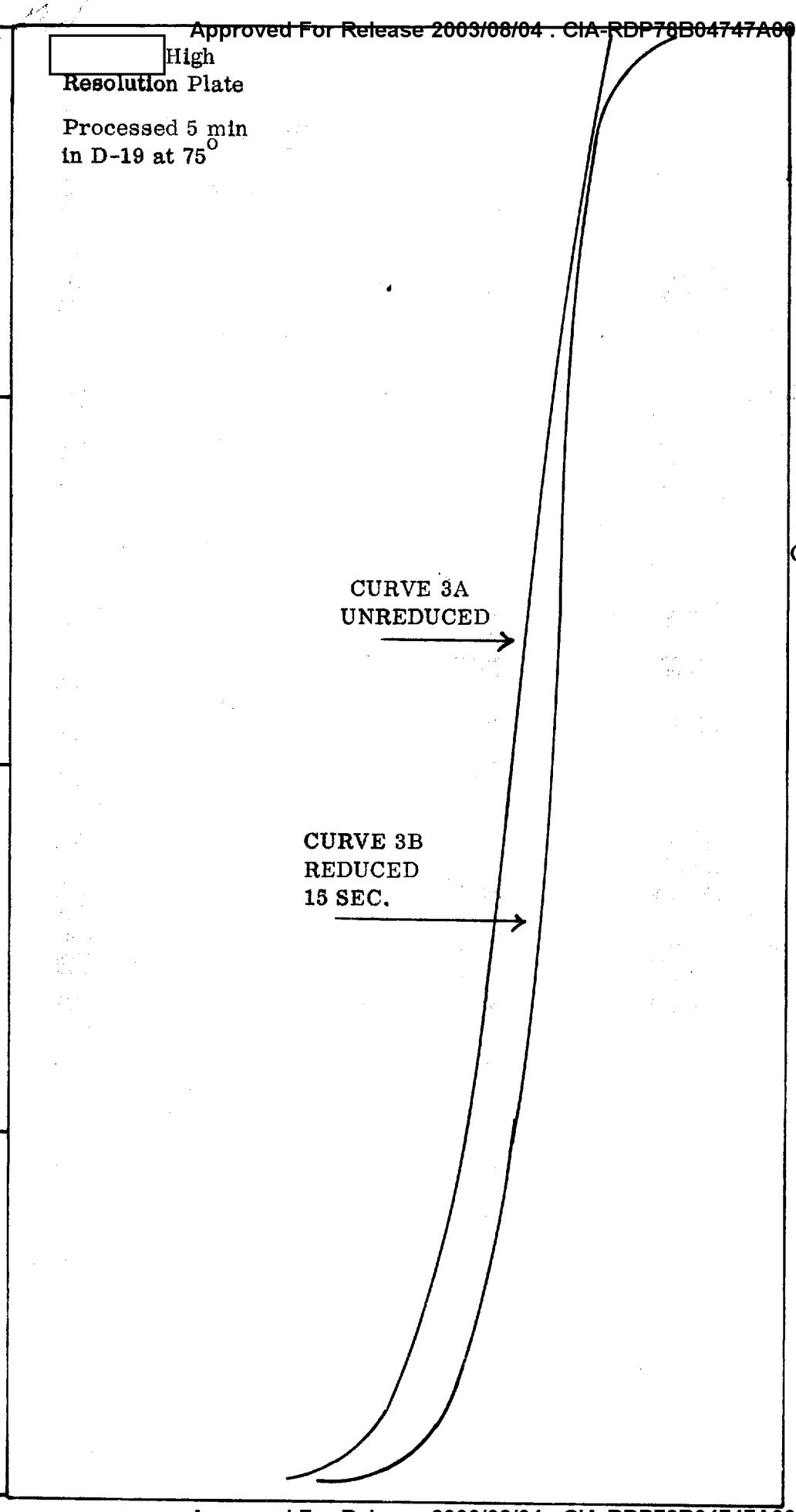
CURVE 2B
10% solution
K-12 Prehardener

CURVE 2A
100% Solution
K-12 Prehardener

LOG E →

STAT [redacted] High Resolution Plate

Processed 5 min in D-19 at 75°



	Curve 3A	Curve 3B
1.	0.05	0.05
2.	0.05	0.05
3.	0.05	0.05
4.	0.06	0.05
5.	0.08	0.05
6.	0.12	0.05
7.	0.21	0.06
8.	0.45	0.13
9.	0.95	0.33
10	1.73	0.75
11	2.35	1.41
12	3.18	3.11
13	3.94	3.52
14	4.00+	3.85
15		3.89
16		4.00
Speed	9.2	11.1
Gamma	10.3	14.0

The reducing solution which consists of 1 part 0.10 normal potassium ferricyanide to 1 part of 1.0 molar or approximately 2.0 normal sodium thiosulfate, is sprayed after the plates have been fixed. The plate, emulsion laden with hypo, receives the reducer solution with an effective ratio of 1:2 or 1:3 between reducing agent and the clearing agent. Ratios of this magnitude reduce the plate equally regardless of the density; thus having more of an effect on the toe areas of the curve. However, as the time of spraying progresses, the ratios rapidly approach 1:1 which now acts more nearly like a proportional reducer, that is removing more silver where more is present. Proportional reduction is further accented when the reducer cycle is completed and followed by a rinse cycle. The water tends to displace the hypo solution from the emulsion faster than the ferricyanide due to the difference in ionic strengths. Now the emulsion is reduced by the ferricyanide uninhibited by the thiosulfate ion. A reduction series of this type could account for the loss in Dmax, but an increase in gamma.

Use of a reducing solution in processing has an adverse effect on the edges of large area bars as found in the microstep wedges and low frequency groups. Bars which are thick in emulsion depth, with respect to total emulsion thickness, tend to have long edge gradients with low density at the image edges. The reducer acting as a cutting reducer lowers the density in the toe or low density areas increasing the slope of the edge (See Figure I). However, when the reducer starts to reduce more in a proportional manner, the higher densities or lower edges of the bar are reduced more than low density edges; thus increasing the radius of curvature of the bars lower edge. (See Figure II)

The trace of an edge demonstrating this effect is shown in Figure III. In order to reduce this problem the exposure of the bar should be restricted to the upper surface of the emulsion using exposure control and absorption dyes.

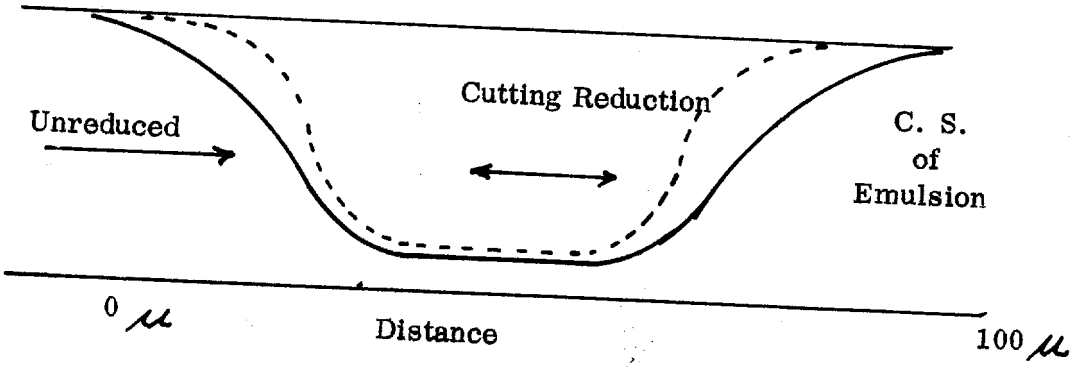


Figure I

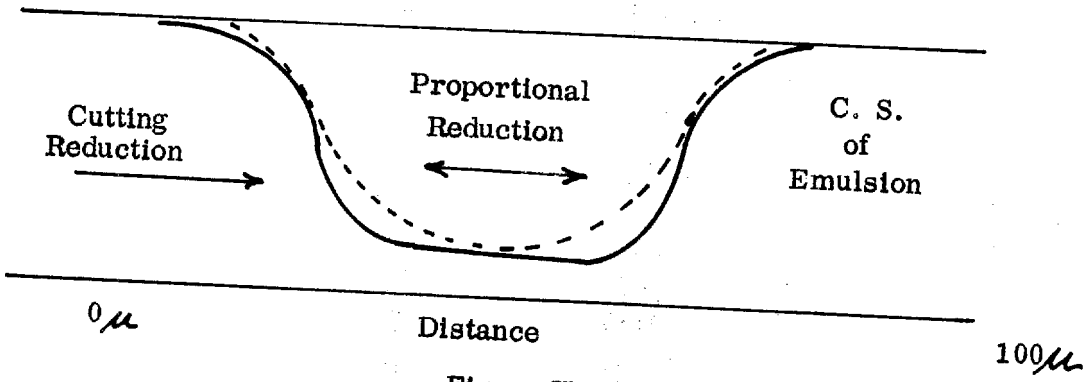


Figure II

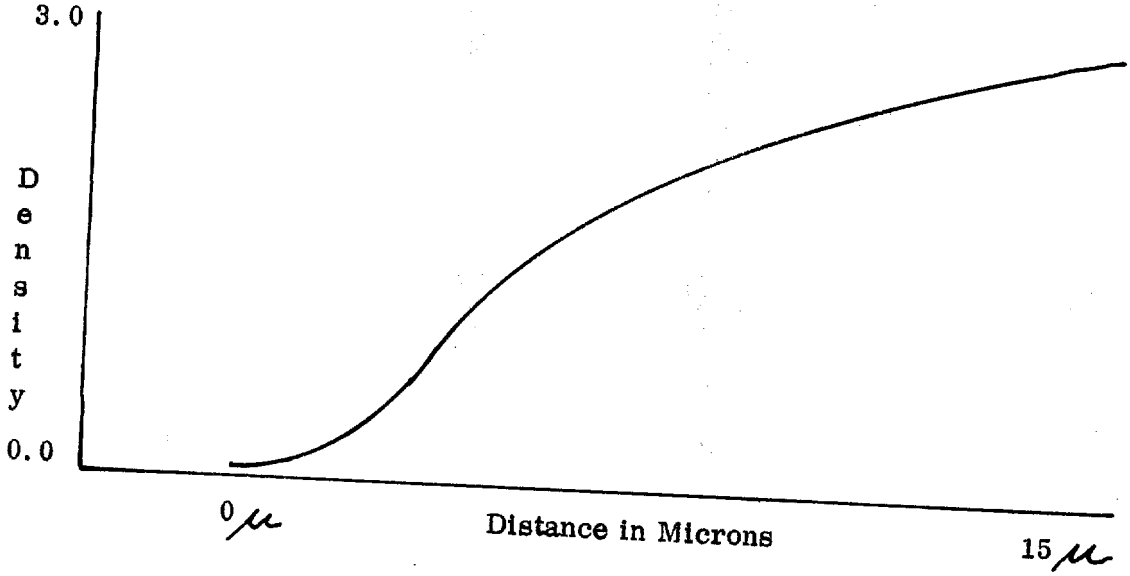


Figure III

BIBLIOGRAPHY AND FOOTNOTES

1. Parsonage, H. N. and Pittman, G. A. 'An Investigation into the Effects of pH, Ionic Strength, and Drying Temperature on the Dimensional Distortion of a Fine Grain Printing Film', May, 1964, Rochester Institute of Technology, Rochester, New York

2. James, T. H. and Higgins, G. C. 'Fundamentals of Photographic Theory' 2nd Edition 1960 Morgan and Morgan, Inc., New York

3. Daniels, F. and Alberty, R. A. 'Physical Chemical' 2nd Edition 1962 John Wiley and Sons, Inc., New York

APPENDIX I

PROCESSING SOLUTION FORMULAS

MIX SHEET

*PreHardner - K-12	1	Liter	1	gal	5	gal
Sulfuric Acid 36N	1.7	ml	6.4	ml	32.0	ml
Sodium Tetraborate (Penta)	15.0	g	56.5	g	282.5	g
Sodium Bisulfite	1.0	g	3.78	g	18.9	g
Sodium Sulfate	200.0	g	755.0	g	3.77	kg
Formaldehyde 40%	20.0	ml	75.5	ml	377.0	ml
Potassium Bromide	2.0	g	7.55	g	37.7	g
Water to	1.0	liter	1	gal	5	gal

pH 20°C

Sp Gr 20°C

TA

*For use dilute 1:part pre-hardener to 9 parts water.

DATE: Operator:

Volume Mixed:

MIX SHEETS

KODAK D-19	1 LITER		1 GAL		5 GAL	
Water at 125° F	500	ml	2500	ml	3	gal
Metol	2.0	g	7.6	g	38.0	g
Sodium Sulfite (Dess.)	90.0	g	340.0	g	1710.0	g
Hydroquinone	8.0	g	30.3	g	150.5	g
Sodium Carbonate (Monohydrate)	52.5	g	198.0	g	998.0	g
Potassium Bromide	5.0	g	16.3	g	81.8	g
Water to	1	liter	1	gal	5	gal

PH at 20°C =

Sp. Gr. at 20°C =

T.A. =

Date:

Operator:

Volume Mixed:

MIX SHEET

SULPHATE STOP BATH	1 LITER	1 GAL.	5 GAL.
Water at 100° F	700 ml	3 liters	4 gal.
Glacial Acetic Acid	12.0 ml	45.0 ml	230.0 ml
Sodium Sulphate (Anhy)	45.0 g	170.0 g	845.0 g
Sodium Formaldehyde Bisulfite	4.5	17.0	85.0
Water To	1000 ml	1 gal	5 gal

pH at 20°C =

Sp. Gr. at 20°C =

TA. =

Date:

Operator:

Volume Mixed:

MIX SHEET

RAPID FIXER	1 LITER		1 GAL		5 GAL	
Water 80°F.	500	ml	3	qts	3	gal
Ammonium Thiosulfate (60%)	200	ml	755	ml	3785	ml
Ammonium Chloride	25.0	g	94.0	g	472.0	g
Sodium Sulfite (Dess)	50.0	g	188.0	g	940.0	g
Sodium Sulfate (Anhy)	32.0	g	121.0	g	605.0	g
Sodium Formaldehyde Bisulfite	4.5	g	17.0	g	85.0	g
Sodium Bisulfite	3.5	g	13.0	g	66.0	g
Water to	1	liter	1	gal	5	gal

MIX SHEET

NON-HARDENING FIXER	1 LITER	1 GAL.	5 GAL.
Water 80° F	500 ml	3 qts	3 gal
Sodium Thiosulfate (Penta)	250 g	945 g	4725 g
Sodium Sulfite (Dess)	50.0 g	188.0 g	940.0 g
Sodium Sulfate (Anhy)	32.0 g	121.0 g	605.0 g
Sodium Bisulfite	3.5 g	13.0 g	66.0 g
Water to	1 liter	1 gal	5 gal

PH at 20°C =

Sp Gr at 20°C =

TA =

Hypo Index =

Date:

Operator:

Volume Mixed:

MIX SHEET

HYPO CLEARING	1 LITER		1 GAL		5 GAL	
Water at 80° F	800	ml	3	qts	4	gal
Ammonium Sulfite	5.3	g	20.0	g	100.0	g
Sodium Bisulfite	11.0	g	41.5	g	200	g
Water to	1	liter	1	gal	5	gal

PH at 20°C =

Sp. Gr. at 20°C =

Date:

Operator:

Volume Mixed:

MIX SHEET

BLEACH		1 LITER		1 GAL.		5 GAL.	
Water	70° F	500	ml	3	qts	3	gal.
Potassium Ferricyanide	.1N	10.97	g	41.5	g	207.3	g
Water to		1	liter	1	gal	5	gal

PH at 20°C =

Sp Gr at 20°C =

Redox Index =

Date: Operator:

Volume Mixed:

APPENDIX II

PROCESSING CYCLES

Original:

Step No.	Solution	Time	Value No.	Operation
1	Water	30 sec.	6	Pre-soak
2	D-19	5-20 min.	1	Develop
3	Stop Bath	60 sec.	2	Arrest
4	Water	30 sec.	6	Rinse
5	Rapid Fixer	3 min.	3	Clear Film
6	Water	30 sec.	6	Rinse
7	Hypo Clearing	2 min.	4	Remove Hypo
8	Water	30 sec.	6	Rinse
9	Water	20 min.	6	Wash

Revised:

Step No.	Solution	Time	Value No.	Operation
1	D-19	5-20	1	Development
2	Stop Bath	60 sec.	2	Arrest
3	Water	45 sec.	5	Rinse
4	Non-hardening Fixer	5 min	6	Clear Film
5.	Ferricyanide, and Fixer	15 sec.	3 & 6	Reduce Image
6.	Water	45 sec.	5	Rinse
7.	Hypo Clearing	2 min.	4	Remove Hypo
8.	Water	45 sec.	5	Rinse
9	Water	25 min.	5	Wash

Tech Rep copy

MPR-65-67

CONTRACT STATUS REPORT NO. 8

PROJECT JS-411

Period: February 25 through March 25, 1965

April 12, 1965

STATINTL by

[redacted]

STATINTL

[redacted]

CONTRACT STATUS REPORT NO. 8

PROJECT JS-411

EQUIPMENT FOR EXPOSING TARGETS

The new set of condenser lenses was received and installed during this period. The X, Y, and Z position of the aperture plate, which acts as the light source, was initially positioned by viewing the magnified image produced by the 40X objective lens.

A focus test was run with a master which produced a three bar group at 575 lines per millimeter (9-2 MIL STD). The focus settings were 50 microinches apart, and this small difference could be observed in the targets. Even though the targets were overexposed, the resolution was good. The bars have good edges.

Next, the X and Y position of the aperture plate was adjusted to produce even density over a step wedge bar. Following this, a test was run to determine the Z position of the plate. This test has not been evaluated yet, because it was performed at the end of the period.

During the next report period, the adjustment of the lamphouse will be completed, and we will run exposure tests to determine the exposure required for a constant density target. A program for setting the X and Y target position to make a target leg will be calculated on the 1620 computer.

SPRAY PROCESSOR TESTING

Testing of the spray processor was completed during this period. Control limits were established for the process. The typical gamma for a development time of 5 minutes in D-19 at 68° F. is 7.83. The spray processor will be used for all future testing.

MICROSPOT RESEARCH

A program was written and debugged for taking the density values from a microdensitometer trace and obtaining a smoothed curve of the transmission, and transmission derivative. This program was used with a chrome edge trace, and edge traces from a typical target. More work will be done on this in the next report period.

PROTECTIVE OVERCOATINGS

Preliminary investigations are now under way on protective overcoating of high resolution plates. The first tests consisted of making 20% solutions of hydroxyethyl cellulose and 2% plasticizer to provide protection during the printing operation. Immersion oil allowed to lay on plates with coatings of different viscosities for one hour was easily removed with ether. This was accomplished without removing the coating, thus keeping the oil out of the emulsion. The coating was easily washed off with water, though. The next tests will use cross linking agents to provide a coating which will be insoluble in organics or water. This type of coating is intended for use on the plates after processing, so that they may be traced with oil, cleaned and shipped to our customer. In turn the customer may trace or print with oil and still clean his plate, with little or no damage to the target. The biggest problem will be in producing even, uniform, thin, and repeatable coatings. Two methods which could be used are skim coating and centrifugal spin coating.

25X1A

FINANCIAL INFORMATION

Total Amount Authorized	
Total Amount Committed through 31 January 1965	
Total Amount Committed during February 1965	
Total Amount Committed through 28 February 1965	
Uncommitted Balance on 28 February 1965	
Total man-hours delivered through 28 February 1965	

Tech Rep Cy
MPR-65-53

CONTRACT STATUS REPORT NO. 7

PROJECT JS-411

Period: January 26, 1965 through February 25, 1965

March 22, 1965

by

STATINTL

[redacted]

STATINTL

[redacted]

CONTRACT STATUS REPORT NO. 7

PROJECT JS-411

Sensitometric testing was carried out on the spray processor. These tests pointed up a few problems, some of which were corrected during this period. The backs of the plates were not being properly cleaned, so a nitrogen gas manifold was added to blow solution across the rear of the plates. Testing will continue in the next period.

The new condenser lenses required for the 40X objective were not received during this period. Consequently, no testing was done on exposing the test targets.

Edge traces were made of a bar on a standard, high contrast target. Time did not permit them to be analyzed, but they will be analyzed during the next period.

Sufficient materials and equipment were assembled to make some preliminary coatings by means of vacuum evaporation technique. The coating was fogged, probably during the coating process. This method of producing plates shows promise but would require too much effort to be feasible at this time.

FINANCIAL INFORMATION

25X1A

TOTAL CONTRACT

a. Total amount authorized

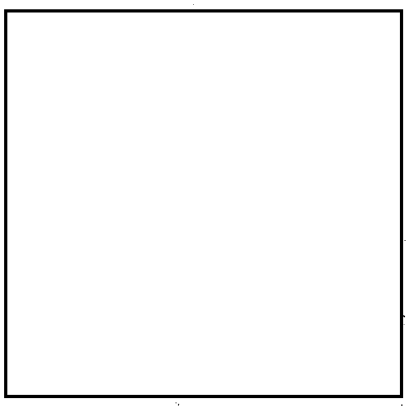
b. Total amount committed through December 31, 1964

c. Total amount committed during January 1965

d. Total amount committed through January 31, 1965

e. Uncommitted balance on January 31, 1965

f. Total man-hours delivered through January 31, 1965



Tech Rep Cy
MPR-65-25

CONTRACT STATUS REPORT NO. 6

PROJECT JS-411

Period: December 25, 1964 through January 25, 1965

February 10, 1965

by
STATINTL

STATINTL

CONTRACT STATUS REPORT NO. 6

PROJECT JS-411

MICRO-SPOT RESEARCH

During this period the program to synthesize the tracing of a target with a Micro-Spot was run on the computer. The first test was the tracing of an ideal or perfect target with a spot whose light distribution was based on results of the slit experiments. This gave reasonably good results. The program was used to obtain the expanded edge from tracing the first bar in group 2-1. The edge trace did not look like typical edge traces of real targets, indicating that our assumed light distribution is not correct.

For further test, we assumed a light source which has a one dimensional Gaussian distribution. This gave a better result in the toe portion of the edge trace, but it is not right in the high density area. A light distribution somewhere between the two employed to date will be tried in the next period.

SPRAY PROCESSOR

The spray processor was assembled, but it was not tested during this period, due to difficulties with the solution valves on the intake side of the pump. New valves were ordered, received and installed. Other minor problems, such as leaks, were encountered. These were corrected. Resolution testing will start at the beginning of the next period.

EQUIPMENT FOR EXPOSING TARGETS

The lamphouse for the Step and Repeater was completed, as well as the automatic exposure control system.

With the 40X Zeiss objective in the Step and Repeater, we were unable to focus the condenser lens system in the new lamphouse. The focal length of the condenser lenses was too short. There are two reasons for this. First, these lenses were ordered for a tube length which gave 1040 lines per millimeter, and the tube length was later increased. Second, an incorrect estimate was made of where the image focused in the 40X objective.

New condenser lenses were designed on the computer, and ordered. They will

be received and installed in the next period.

The Step and Repeater was moved into the clean room area in preparation for testing. Initial focus and exposure tests can be performed during the next period.

PROCESSING RESEARCH

DYE IMAGES. Preliminary investigations were made into the possibility of producing dyed images on 649-GH emulsion, using the color coupler formulation of the K-12 process. One liter of each of the primary color developers (cyan, magenta, and yellow) as well as the recommended potassium ferricyanide-potassium persulfate bleach and fixer, were mixed. Strips exposed on a 0.10 delta density wedge were then processed in 200 milliliters of the respective solutions. A time-gamma series was run for each color developer. The cyan dyed strips have very high red light gamma, while the yellow strips have a very low blue light gamma. The magenta strips have medium to high gamma under green light but have very high chemical fog with prolonged development.

Tests were also run in an attempt to produce a neutral image. The strips were given sequential color development, i.e., each development step was followed by rehalogenation and bleaching to prepare the strip for the next color developer. This proved successful to the extent that a green of high purity was obtained (cyan dye and yellow dye at seven minutes of dying for each). The development in the magenta added only a slight chemical fog with no developed image. This is due to loss of the latent image from successive bleaching and rehalogenation.

Further investigations of dye image production will deal with correcting the low yellow gammas and the high magenta fog.

PROTECTIVE OVERCOATINGS. Techniques for printing targets with one thousand lines per millimeter will incorporate oil immersion printing and tracing. Hence, an investigation is under way to find protective coatings for 649-GH emulsion to keep the oil from impregnating the emulsion, as well as making it feasible to wash off the oil after use. "Cellosize", a high viscosity ether of cellulose produced by [redacted] STAT Corporation, is presently being evaluated. The hydroxyethyl cellulose, applied as a film on a plate, has characteristics such that it is soluable when immersed in water

but is insoluable in and impenetrable by oils or other organic substances. These characteristics fulfill the requirements for precoatings on plates to be printed by oil immersion techniques.

Using a plastizer (such as glycerol and a hydroxyaldehyde) as a cross linking molecule, the cellulose compound may be made water and organic insoluble. Such is the requirement for a material with which to coat the plates after processing to allow oil immersion tracing techniques and to protect the surface from abrasion. Using other chemical addenda, we should be able to adjust the index of refraction of the coating to that of the oil or the photographic emulsion gelation, thus eliminating refraction at the boundary.

This investigation will be pursued in the hope that this final overcoating step can be incorporated into the spray processor. This arrangement would make it feasible to have a dry-to-dry process fully automated.

DEVELOPER PROGRAMS. The first program (investigating changes in developer concentration, anti-foggant concentration, and time) has been completed. Data analysis, using statistical techniques previously described, indicated that about 0.4 grams of AF-71 gives maximum fog protection with the smallest loss in speed. With the same amount of basic salts in the developer investigated, increasing the hydroquinone concentration above 45 grams/liter showed no significant increase in gamma or speed. In a smaller experiment, we will increase the alkali content and temperature and rerun the time gamma series up to twenty minutes. The first test indicated that any increase in time of development above twenty minutes did not significantly alter speed or gamma.

In a fully replicated experiment now under way, we are investigating the use of Ascorbic acid in a sulfite-free developer. The program will also investigate the use of two different alkali, three concentrations of a silver halide solvent, four concentrations of developer ion, and four concentrations of neutral salt to adjust development rates.

One problem encountered in the program is the increased sensitivity of the developer-film combination to latent image failure. Using D-19, there is a period of

about one hour from exposure to processing without noticeable latent image deterioration. In this program, some treatment combinations indicate that a period of 30 minutes is very significant. Hence, the film will be exposed, then stored in an insulated chest with dry ice until we are ready to develop it.

25X1A

FINANCIAL INFORMATION

a. Total amount authorized

b. Total amount committed through November 30, 1964

c. Total amount committed during December 1964

d. Total amount committed through December 31, 1964

e. Uncommitted balance on December 31, 1964

f. Total man-hours delivered through December 31, 1964: 1,152.4

Tech Rep Cy
MPR-65-10
Proj# 947154
28 Jan 64
RFD

CONTRACT STATUS REPORT NO. 5

PROJECT JS-411

Period: November 27 through December 25, 1964

January 13, 1965

by

STATINTL

STATINTL

CONTRACT STATUS REPORT NO. 5

PROJECT JS-411

PROGRESS DURING THIS PERIOD

LITERATURE. The literature search pertaining to the preparation and evaporation of light sensitive silver bromide was concluded.

PLANS AND PREPARATION FOR EXPERIMENTAL COATING. The materials for initial testing have been ordered. Glass plates have been prepared and some of the setup work on the evaporator unit has been performed while waiting for materials.

The coating is greatly affected by the shape of the boat of emulsion, as well as the temperature of the boat and substrate. Evaporation from a surface of appreciable size will adversely affect the coating, due to unavoidable temperature variation across the surface. To minimize this variation, the boat will be covered with a lid having a small, centrally located hole. A platinum-rhodium (13% thermocouple will be used to avoid contamination of the emulsion material.

The necessary materials should arrive in January, and coating will be started at that time.

CALIBRATION RESEARCH. The FORTRAN program written during the last period to evaluate the digitized microdensitometer traces was partially rewritten. The original program did not do an accurate job of determining the bar and space widths; consequently, it could not accurately determine line to space ratio and spatial frequency. In the revised program, a third order polynomial equation is fitted to the digitized points at each edge, by the use of a least squares technique. Using these equations, it is possible to extrapolate accurately and find the distance between points of equal density or transmission on the leading and trailing edges of each bar. The bar is assumed to start when the transmission is midway between maximum (in spaces) and minimum (in bars) average values. At this time, half of the tracing spot is hidden behind the bar.

The FORTRAN program to synthesize the tracing of a target with a Micro-Spot was written and is being tested. Initial tracings are being made on an ideal, three bar

target (whose edge rises with infinite slope) of density 2.5 with a spot whose light distribution was determined by experiments with different sizes of lower slit. The resulting traces are similar to the microdensitometer traces. Future work will check statistically for correlation between real and simulated traces.

PROCESSING EQUIPMENT. Some mechanical difficulties were encountered with the solenoid valves on the spray processor which prevented us from testing the unit during this period. During the period, a rotary valve was added to the processor to switch the drain line. Early in the next period the unit will be operational, and resolution testing of the spray processor will be performed.

EQUIPMENT FOR EXPOSING TARGETS. The lamphouse for the step and repeater is being rebuilt to obtain more even illumination of the target area and closer control of exposure. It will be in operation during the next period.

FINANCIAL INFORMATION

25X1A

a. Total amount authorized

b. Total amount committed through October 31, 1964

c. Total amount committed during November 1964

d. Total amount committed through November 30, 1964

e. Uncommitted balance on November 30, 1964

f. Total hours delivered through November 30, 1964 - 512.4 man-hours.

STATINTL

CONTRACT STATUS REPORT NO. 3

PROJECT JS-411

Period: September 25 through October 23, 1964

November 3, 1964

STATINTL

Approved For Release 2003/08/04 : CIA-RDP78B04747A001200030001-5

CONTRACT STATUS REPORT NO. 3

PROJECT JS-411

GENERAL

In order to produce resolution targets of higher line frequency than we are presently doing, it will be necessary to upgrade each step in the manufacturing process. The calibration equipment must also be upgraded. The four major steps in manufacturing and calibrating targets are:

a. Obtaining suitable photosensitive materials for producting targets.

b. Exposing the photosensitive emulsion (Obtaining the aerial image on the surface of the emulsion.

c. Processing the exposed photosensitive emulsion.

d. Calibrating the finished target.

PHOTOSENSITIVE MATERIAL

At the present time we are using [redacted] high resolution plates, emulsion type 649-GH. These have extremely fine grain, and are capable of resolving two or three thousand lines per millimeter. The emulsion coating on the glass is about 6 or 8 microns thick, but will still yield a density of more than 4. STAT

It would be desirable to have a thinner emulsion for the higher line frequencies, since maximum resolution is obtained when the bars are formed just below the surface of the emulsion and do not go down into the emulsion. We inquired of the [redacted] but they cannot reliably coat a thinner emulsion than they are presently doing. STAT STAT

We have considered coating our own plates, and from time to time have done some research toward this end. However, in view of the limited time available to produce targets, we cannot rely on having our own materials available. Samples of high resolution plates from other manufacturers have been tested and are not as good as plates made by [redacted] STAT

Since there is only one usable emulsion material with acceptable performance, we felt that perhaps the resolution performance could be improved by changing the spectral response of the material, the optical density of the emulsion or both.

Initial tests run with a sharpening dye introduced into 649-GH emulsions prior to exposure show a great deal of promise. The dye concentrations investigated indicate a significant increase in percent transmission modulation response for the higher line frequencies over the untreated emulsion. That is, a higher response is observed for elements 8-6, 8-5, and 8-4 in the dyed emulsion as opposed in the undyed emulsion. However, below 8-4 the dyed emulsion has a lower response than the undyed. This is attributed to the loss in density which is a uniform amount through the dyed target. It is felt that the dye is acting in a sharpening or low level attenuator manner and hence keeping the density between the bars down while at the same time it is reducing the maximum density. At lower frequencies (larger bars) the maximum density is not a problem and a loss of density from the top can be overcome by properly increasing the exposure to overcome the loss of density due to the dye attenuation.

In conjuction with the testing of the dye to determine its effect on resolution, experiments were run to determine the sensitometric response changes made by the dye. These have not been completed as yet.

EXPOSING TARGETS

The targets are exposed, using a form of reducing camera. Negative masters are backlighted, and imaged on the emulsion with a microscope objective. The sensitized plates are accurately positioned in X and Y for each exposure.

The lamphouse presently uses a point source arc lamp with diffusion, an aperture plate, a wratten filter to adjust the spectral output, and a shutter operated by an electronic integrating exposure control system. A single condenser lens is used. Lenses are on order to change this to a two-element condenser, using positive miniscus lenses. These will give better light distribution over the target area. The diameter of the light source (hole in aperture plate) will be reduced, in order to approach a point source.

A 40x Zeiss lens, 1.0 n.a. will be used for the targets. This will require exposing with oil on the emulsion, and cleaning before processing. Tests were run to determine whether the oil affected the photosensitive emulsion sensitometrically, and whether the oil could be removed. Results of both tests were satisfactory.

A compressed air gauge will be clamped on the lens to measure directly the lens to emulsion distance. Focus of the lens is critical for best resolution. A clamp has been fabricated, and the air gauge will be obtained next month.

The X and Y drive of the step and repeater are capable of positioning to one micron. This is not good enough for accurate spacing between three bar groups, but should give acceptable spacing between major groups (six three bar elements of a group) if each major group is printed with a single master, and double spacing is used between groups.

PROCESSING THE EXPOSED PLATES

STATINTL Presently we are developing the emulsion in [redacted] formula D-19 in the [redacted] STATINTL STAT sensitometric processor. Under development at this time is a sensitometric spray processor. Sensitometric tests have shown that the spray development gives a higher gamma, with a longer straight line portion to the curve, and a sharper toe region. Resolution testing of the spray processor will be done next month.

Other standard developers and modifications of standard developers will be tested to determine if better resolution can be obtained than with formula D-19.

CALIBRATION

The use of the STATINTL [redacted] microdensitometer for calibrating the targets was discussed in detail in the first two status reports. During the past month the slit experiment was rerun, but time did not permit analyzing the results. We hope and expect to do this during the next month.

SUMMARY

In this status report I have tried to outline our present method of target production, and what must be done to improve the results at each step. Progress on this program has been slowed by previous target commitments. Such work will be done in the next few weeks, thereby giving us more time to spend on this project.

25X1A

FINANCIAL STATEMENT

Total Amount Authorized	
Total Amount Committed through August 31, 1964	
Total Amount Committed during September, 1964	
Total Amount Committed through September 30, 1964	
Uncommitted Balance on September 30, 1964	
Total Number of Man-Hours worked through September 30, 1964	

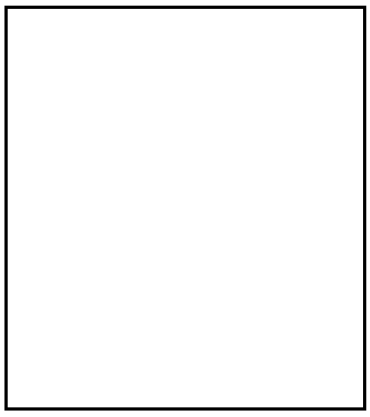
CONTRACT STATUS REPORT NO. 2

PROJECT JS-411

Period: August 25 through September 25, 1964

September 30, 1964

STATINTL



CONTRACT STATUS REPORT NO. 2

PROJECT JS-411

PROGRESS DURING PERIOD

STATINTL

During the past month, work continued on [redacted] research. Photographs were made of the projected spot in front of the lower restricting aperture, which is slightly ahead of the photomultiplier. For these photographs a 1.1 micron diameter spot was focused on the glass platen, with no photographic emulsion on the platen. The results showed the projected spot to be approximately circular and to have a decreasing light intensity with increasing distance from the center. The majority of light is in a circle whose diameter is approximately equal to the expected spot diameter multiplied by the magnification factor.

Measurements of the percentage of light available when using several lower slit widths were made with the photomultiplier under identical conditions. These measurements resulted in a one dimensional picture of the percentage of light versus distance from the spot center. A computer program was written to obtain an approximate two dimensional light distribution, assuming radial symmetry. For the spot tested, there is a high intensity circle about the size of the magnified spot, and going out from this the light falls off with increasing radius. Unfortunately the intensity does not fall off very fast.

A high quality vacuum platen was fabricated for holding film during exposure in the Step And Repeat Printer. With the ultra flat platen, we will be able to keep the film in focus while printing the target.

PLANS FOR NEXT PERIOD

In the next month additional Microspot tests will be run to determine the light distribution with different spot sizes, with different upper and lower objective lenses, and both with and without a photographic emulsion on the platen.

In the next month an adapter ring for the 40X objective of the Step And Repeat Printer will be designed and fabricated. Initial tests will be made by printing 1000 line groups on glass plates.

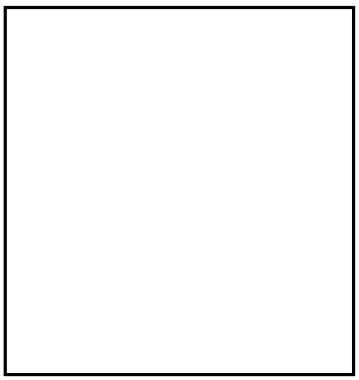
CONTRACT STATUS REPORT NO. 1

PROJECT JS-411

Period: July 6 through August 25, 1964

August 30, 1964

STATINTL



CONTRACT STATUS REPORT NO. 1

PROJECT JS-411

GENERAL

The purpose of this research contract is to develop methods for producing and calibrating ultra-high resolution target standards. The contract requires the delivery of three high contrast targets on glass and three on film, all with 1040 lines/mm, along with complete calibration information for these targets.

PROGRESS DURING THE PERIOD

STATINTL This contract was received by [redacted] on July 6, 1964 and assigned to the [redacted]

STATINTL Several informal meetings of personnel assigned to this project were held at the [redacted] offices. As a result of these meetings it has been decided that the first task to be undertaken will be to determine a suitable method of calibrating the 1040 lines/mm targets.

MICRO-ANALYZER IMPROVEMENT

Calibration of the 1040 lines/mm targets will require the use of a STATINTL [redacted] tracing light source in the Micro-Analyzer which is much smaller than any of those presently available.

At the present time the microspot sizes available for tracing and calibration of targets on the microdensitometer are barely adequate for 260 lines/millimeter. In order to calibrate higher line frequency targets accurately, it will be necessary to upgrade the STATINTL [redacted] system of tracing.

DISCUSSION OF THE PROBLEM

The factors effecting the spatial frequency response of the microdensitometer, both directly and indirectly, may be summarized as follows.

1. Diameter of the point source of light emerging from the spot former.
2. Quality of objective lens used to image the spot of light from the spot former

on the emulsion.

3. Focus position of the projection lens. This includes, not only the initial focus setting, but also the possibility of changes in focus resulting from mechanical instability of the Micro-Analyzer and lack of flatness in the specimen.

4. Color content of light used.

5. Pickup system optics. Quality and power of the pickup objective lens.

6. Focus of the pickup system.

7. Lower apertures positioned before the photomultiplier tube, which restrict the pickup cone angle and yield a mixed scanning system, part microspot and part projection microdensitometer.

To upgrade the tracing system, the exact influence of each of the foregoing factors must be determined. The insight thus gained can be used to minimize the individual influences, and it will serve to point out methods for compensation of the traces.

Some investigation has already been done into the first four named factors. A series of traces was made on a 260 lines/mm test target with three spot maker diameters and four lenses of different focal lengths and numerical apertures. The high numerical apertures yield higher spatial frequency response, but not necessarily as high as expected.

The spatial frequency response of the measuring instrument will always decrease with increasing signal frequency, due to the physical characteristics of the machine, which include, for example, the lens used, the wavelength of the tracing light, mechanical positioning accuracy, and stability. Consequently, the response will be only approximately flat to a finite spatial frequency and will fall off at a finite rate above this. Research will be conducted into methods of compensation for this fall-off in response. Accurate compensation may prove to be difficult and time consuming. If so, we will work out approximate compensation techniques which will be easier to apply.

STATINTL

A basic problem facing us is that of understanding the operation of the [redacted] system of density determination. It appears to operate in a predictable manner with large spot sizes and low frequency targets. At higher frequencies and small spots the results are not predictable, obviously because we do not understand fully how the system is operating. It is felt that this understanding will come as the previously listed

factors are investigated.

CONTRACT CHANGES

At the request of the Technical Representative, the profile of the 1040 lines/mm targets will be changed from the proposed "T" to an "L" shape, with the high frequencies adjacent.

WORK PLANNED FOR THE NEXT PERIOD

Included in our work during the next period will be a continuation of the spot size experiment. In addition, an investigation into microscope objectives, plate holders, and film holders will be initiated. These devices must be upgraded to provide improved performance over the present system, in order to meet the contract objectives.

79 7154

[redacted]

May 7, 1965

STATINTL

[redacted]

Dear Sir:

The contract pertaining to 1000 LINE time targets will come to a close on 30 June 1965. In reviewing our progress on this contract, we find that we will be in a position on this date to deliver three glass resolution targets containing 1,150 lines/mm maximum, in accordance with the enclosed drawing, 0065-32-001-40, however absolute calibration of these targets appears to be beyond the current state of the art for microdensitometer methods. These glass targets will be calibrated within our capability. A sample of a Microanalyzer trace of a test target is enclosed for your information. We feel that we have definitely achieved the required 20% density between bars. In fact, the density between the bars appears even lower than the required figure. However, because of the limited spot size, it is impossible to determine the actual contrast ratios for these targets at the high line frequencies.

The contract calls for the delivery of three targets on film including complete calibration information. We find that time and cost will not permit delivery of these items on 30 June 1965. Non-uniform emulsion thickness, film base flatness, film holddown and emulsion response variation are all factors contributing to this problem. We find that the techniques for producing these targets are all but solved; however time and cost do not permit completion by 30 June 1965.

STATINTL

STATINTL A sample of the glass target will be sent to [redacted] to determine if they can calibrate the target, using coherent light techniques. This has been coordinated through [redacted]

STATINTL

We are currently preparing a proposal to be submitted for the continuation of this project. It will include producing the targets on film. In particular, the problem of calibrating these high frequency targets will be outlined and methods proposed for determining their characteristica. In addition the extension of the lines/mm will be studied to determine the limits of the next generation of high resolution targets to be produced.

The first target to be delivered on this contract should be ready for inspection the week of May 24, 1965. We suggest that a visit to our facility would be in order at this time or later to inspect these targets and discuss future plans.

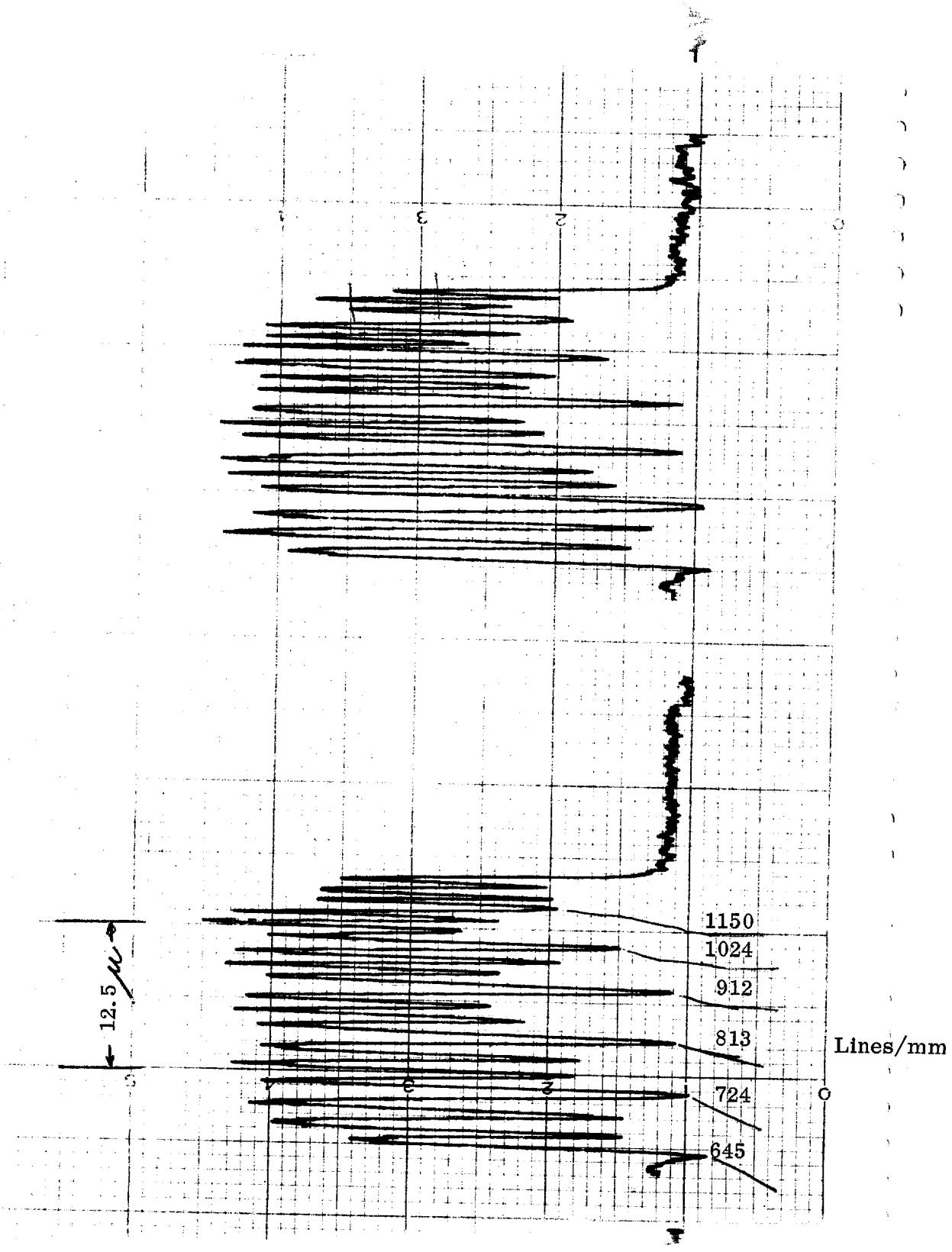
Sincerely,

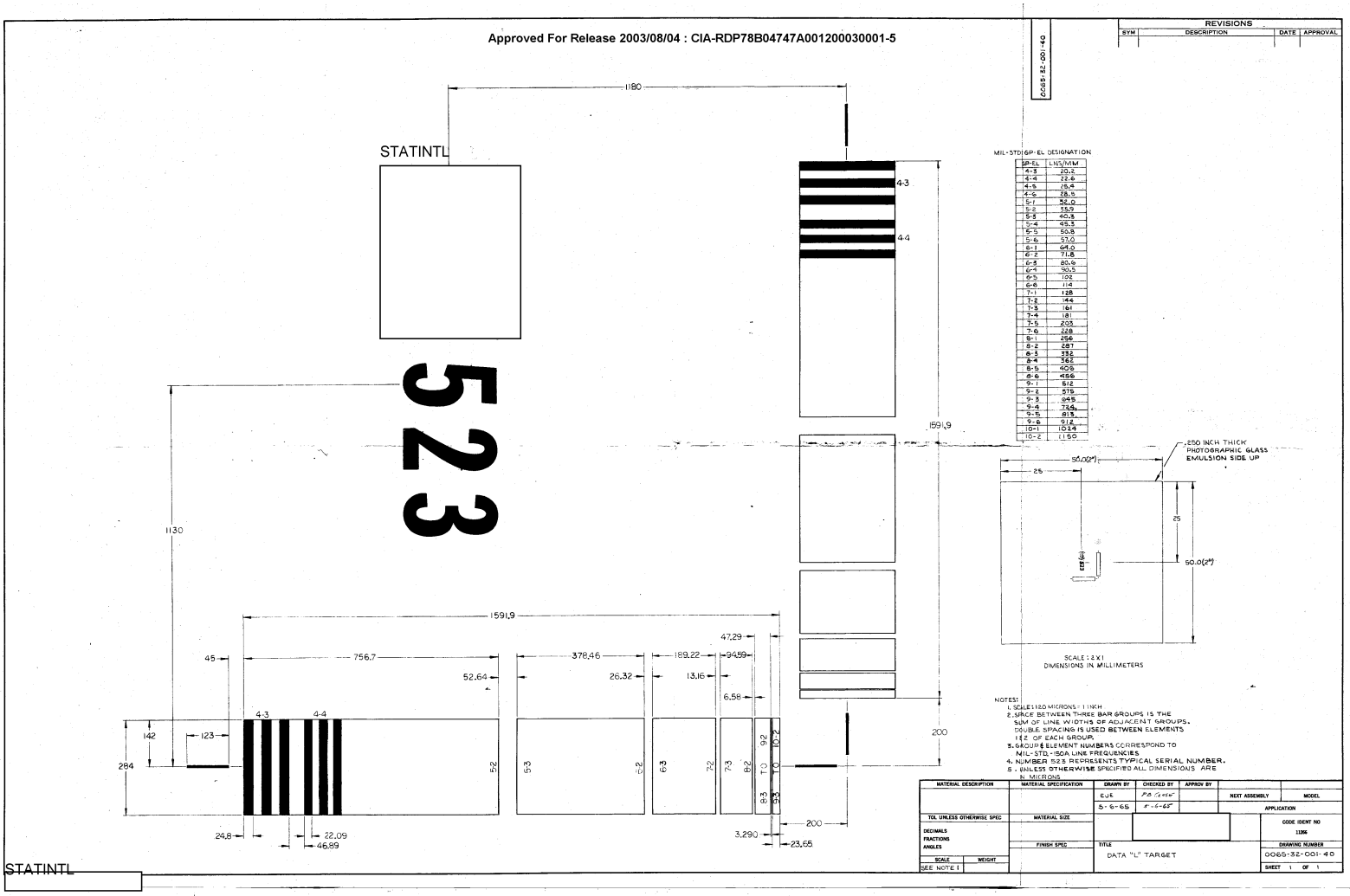
STATINTL

REW/wmt

Trace of the exposure made with a Zeiss 100X oil lens, 1.25 n.a., 5-48 spot maker, L4 lower lens. Lower slit of 40 microns. Calculated spot diameter of 0.062 microns Chart speed of 4"/min, scan rate of 50 micron/min. May 5, 1965

STATINTL





STATINTL

STATINTL

STATEMENT OF WORK

SPECIAL TARGETS FOR INTERPRETATION EQUIPMENT EVALUATION

A. SCOPE

This Statement of Work covers services to be performed and material to be supplied in support of research and experimentation with standards for calibration and evaluation of micro-densitometers, microanalyzers, viewers, and related equipment used in photographic image evaluation. The objective of this program is to determine methods and techniques to upgrade present existing standards to a higher order of performance, that appears achievable within the time period of this program. A broad research and development program should have the following objectives as an aim point:

1. Resolution targets to 1040 lines per millimeter.

B. REQUIREMENTS

The contractor shall supply a minimum of 4000 hours of research and development effort to perform the requirements listed herein. The contractor's technical personnel may be required to perform travel to various Government installations or manufacturers' plants within the continental limits of the United States to coordinate information on the experimental research program.

1. The contractor shall deliver within 90 days of receipt of the contract the following special targets fabricated within the present state-of-the-art.

Four sets of resolution masters, [redacted] drawing No. 0037-81-001-40.

STATINTL

2. In an effort to upgrade the resolution targets, the contractor shall perform research and development in the area of projection lenses, materials, and exposure techniques for fabricating targets. The contractor will investigate to determine the best commercially available emulsions in addition to investigating the possibility of producing light sensitive coatings not limited by present-day techniques. Research and development shall be performed by the contractor in the areas of focusing accuracy, positional holding techniques, vibration problems, and environmental condition.

3. The contractor shall supply within twelve months after receipt of contract the following standards fabricated by utilizing the upgraded state-of-the-art procedures developed during this R & D effort. Twelve sets of resolution standards with complete calibration.

C. REPORTS

The contractor shall submit monthly status reports briefly outlining the results achieved on the experimental research program. A technical report outlining the results achieved in upgrading the present standards and significant results achieved on this R & D program will be submitted at the completion of this contract.

D. PERIOD OF PERFORMANCE

A twelve-month R & D effort is anticipated for this program.

E. FACILITIES

The contractor shall have available in-house the following research facilities capable of performing the required services.

1. Sensitometric test equipment consisting of a minimum of an Eastman Ib sensitometer, a sensitometric processor capable of maintaining processing control to ±0.1°F.

2. Density and measurement instrumentation consisting of a recording micro-densitometer, measuring microscopes, and necessary calibration standards.

3. National Bureau of Standards light standards, light intensity measurement equipment, and integrating sphere for making absolute density measurement.

4. A vacuum coating machine utilizing electron beam bombardment and proper clean room facilities for utilization of this equipment.

5. A special step and repeat device to permit accurately positioning and holding the various standard targets for printing as required.

6. The required flat field optical objectives, both for white light and ultraviolet type light sources.

7. Scanning microanalyzer with positional readout accuracy to .2 micron.

STATEMENT OF WORK

SPECIAL TARGETS FOR INTERPRETATION EQUIPMENT EVALUATION

A. SCOPE

This Statement of Work covers services to be performed and material to be supplied in support of research and experimentation with standards for calibration and evaluation of micro-densitometers, microanalyzers, viewers, and related equipment used in photographic image evaluation. The objective of this program is to determine methods and techniques to upgrade present existing standards to a higher order of performance, that appears achievable within the time period of this program. A broad research and development program should have the following objectives as an aim point:

1. Resolution targets to 1040 lines per millimeter.
2. Density standards to a 1% absolute density value.
3. Linear measurement standards to 0.0001%.

B. REQUIREMENTS

The contractor shall supply a minimum of 4000 hours of research and development effort to perform the requirements listed herein. The contractor's technical personnel may be required to perform travel to various Government installations or manufacturers' plants within the continental limits of the United States to coordinate information on the experimental research program.

1. The contractor shall deliver within 90 days of receipt of the contract the following special targets fabricated within the present state-of-the-art.

Four sets of resolution masters, STATINTL drawing No. 0037-81-001-40.

Six sets of density standards, STATINTL drawing No. 0037-81-003-30. (Film material to be specified by Government Project Engineer).

Two sets linear measurement standards per STATINTL drawing No. 0019-87-003-20 or similar linear standards.

2. In an effort to upgrade the resolution targets, the contractor shall perform research and development in the area of projection lenses, materials, and exposure techniques for fabricating targets. The contractor will investigate to determine the best commercially available emulsions in addition to investigating the possibility of producing light sensitive coatings not limited by present-day techniques. Research and development shall be performed by the contractor in the areas of focusing accuracy, positional holding techniques, vibration problems, and environmental condition.

3. The contractor shall investigate the possibility of producing density standards to a 1% accuracy. Experimentation should include calibration by transmission in a light standards laboratory utilizing as a master reference National Bureau of Standards light sources. The contractor shall utilize R and D techniques outlined in paragraph B.2. above, to achieve the required sharpness as well as density accuracies for these standards.

4. The contractor shall investigate various techniques to produce and calibrate linear measurement standards with an accuracy of 0.0001%. The contractor shall utilize a precision scanning microanalyzer for edge-to-edge measurements

having an accuracy of 0.1 micron if required in the calibration problem.

5. The contractor shall supply within twelve months after receipt of contract the following standards fabricated by utilizing the upgraded state-of-the-art procedures developed during this R & D effort. Twelve sets of resolution standards with complete calibration; twelve sets of density standards with complete calibration; twelve sets of master linear measurement standards with complete calibration.

C. REPORTS

The contractor shall submit monthly status reports briefly outlining the results achieved on the experimental research program. A technical report outlining the results achieved in upgrading the present standards and significant results achieved on this R & D program will be submitted at the completion of this contract.

D. PERIOD OF PERFORMANCE

A twelve-month R & D effort is anticipated for this program.

E. FACILITIES

The contractor shall have available in-house the following research facilities capable of performing the required services.

1. Sensitometric test equipment consisting of a minimum of an [redacted] STAT Ib sensitometer, a sensitometric processor capable of maintaining processing control to $\pm 0.1^{\circ}$ F.

2. Density and measurement instrumentation consisting of a recording micro-densitometer, measuring microscopes, and necessary calibration standards.

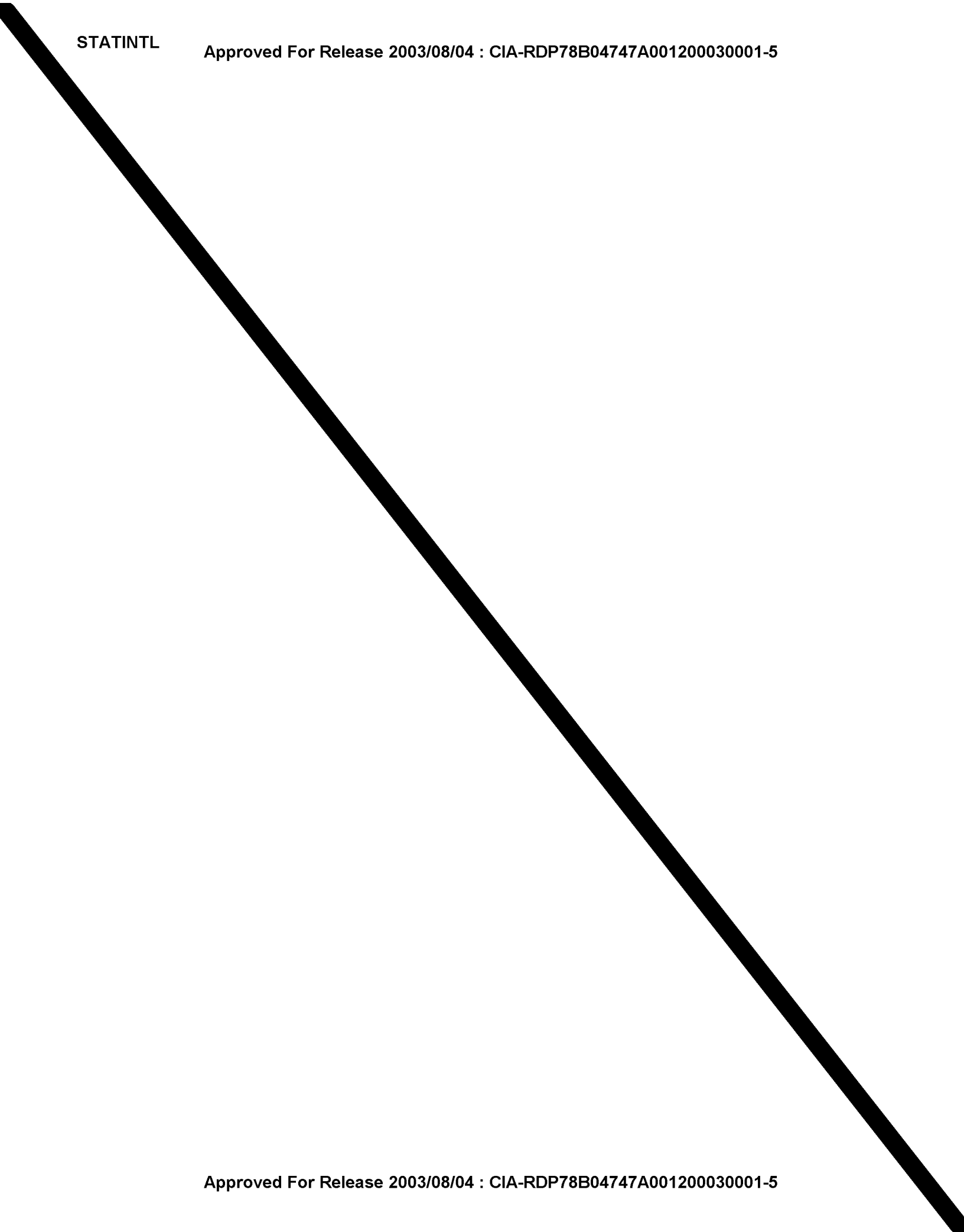
3. National Bureau of Standards light standards, light intensity measurement equipment, and integrating sphere for making absolute density measurement.

4. A vacuum coating machine utilizing electron beam bombardment and proper clean room facilities for utilization of this equipment.

5. A special step and repeat device to permit accurately positioning and holding the various standard targets for printing as required.

6. The required flat field optical objectives, both for white light and ultraviolet type light sources.

7. Scanning microanalyzer with positional accuracy within 0.1 micron.



Approved For Release 2003/08/04 : CIA-RDP78B04747A001200030001-5

STATINTL

41-1

March 6, 1964

STATINTL

P.O. Box 2831
Washington 13, D. C.

STATINTL

We are pleased to submit four copies of our proposal pertaining to "Special Targets for Interpretation Equipment Evaluation" for your consideration. This proposal covers research and experimentation with standards for calibration and evaluation of microdensitometers, micro-analyzers, viewers and related equipment used in photographic image evaluation. The purpose of the proposal is to determine techniques of upgrading existing standards to a higher order of performance. The objective will be a target capable of resolving to 1040 lines per millimeter.

We recommend a performance period of twelve months to accomplish the required work. We estimate a total amount of [redacted] will be required to fund this proposal. Our budgetary estimate is based on the issuance of a CPFF contract.

STAT

We hope this meets all of your requirements. If you have any questions, please contact the undersigned.

Sincerely yours,

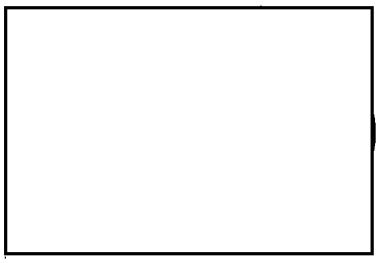
STATINTL

REW:hh
Encl.

TECHNICAL PROPOSAL

SPECIAL TARGETS FOR INTERPRETATION EQUIPMENT EVALUATION

STATINTL



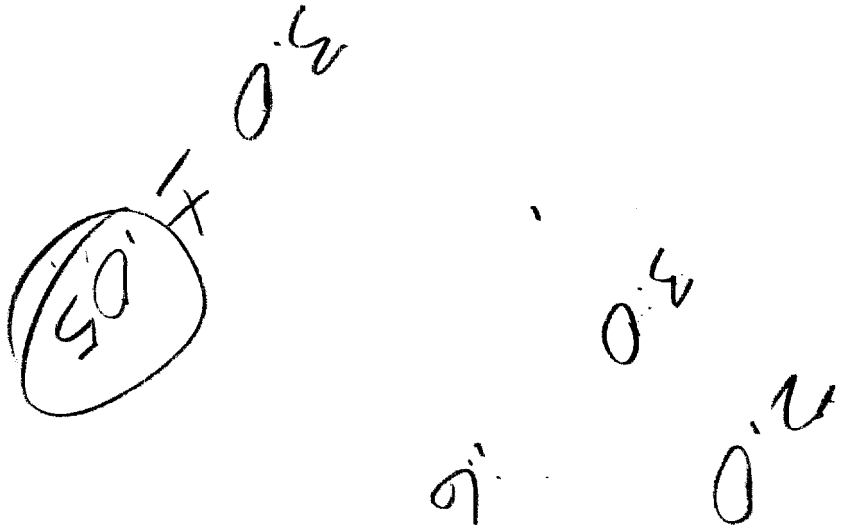
TECHNICAL PROPOSAL

SPECIAL TARGETS
FOR
INTERPRETATION EQUIPMENT EVALUATION

STATINTL

February 4, 1964

STATINTL



TECHNICAL PROPOSAL

SPECIAL TARGETS FOR INTERPRETATION EQUIPMENT EVALUATION

STATINTL [redacted] has been producing a series of standards for calibration and evaluation of micro-densitometers, microanalyzers, viewers and related equipments used in photographic image evaluation. The present series of standards fall in three categories. These categories are standards for (1) resolution, (2) density, (3) linear measurement. The first category is shown in drawing No. 0037-81-001-40 and is known as a T target. The basic bar size ratio was chosen as $\sqrt[6]{2}$ in order to maintain a tie with the MIL-STD-150 target which is basically a manually read target. The bar lengths of the T target have been made long to permit micro-densitometers to read the bar density with the slit lengths required in the older machines. The two sets of targets at right angles permit detection of directional effects when such systems as printers or processors are analyzed. The T target can be made in any contrast ratio desired on either film or glass within the limitations of the sensitive materials.

STATINTL It should be pointed out that definition of resolution for master targets as used at [redacted] means that the density between bars is less than 20% of the density of the bar itself. Currently, 260 line/millimeter targets made on glass with 649GH have a value of density between bars of less than 5% of the value of the bar density. The T targets are made by exposing each group of three elements separately--only by this technique can the exposure of a series of varying sizes be maintained to provide constant bar density to the limits of the material being exposed. Lenses used to expose

STATINTL [redacted]

the material are flat field, four color, specially selected lenses with a low convergency angle. It is most important that the convergency angle be as small as possible since the ability to define a sharp edge depends on exposing as thin an emulsion as possible with as nearly collimated vertical light as possible. It is felt that the present lenses represent the highest existing state-of-the-art for the producing of master targets on photographic materials. A new series of lenses using ultraviolet are on order and will be used to extend the resolution capability of the photographic method of target production. Masters for producing 520 lines/millimeter are available at [redacted] STATINTL. Preliminary tests have been made, but there is not sufficient data to indicate the characteristics of the 520 line target.

While the above-listed standards meet most of the requirements for present-day imagery and equipment evaluation, it is evident that in the near future a considerably improved series of standards will be required to evaluate the next generation of equipments. It is, accordingly, proposed that an R & D effort be funded to permit improvement of standards to a higher order of performance that appear achievable without resorting to drastic changes in techniques for improvement. It is felt that a twelve-month research effort will produce standards capable of achieving the following broad objectives.

Resolution Targets to 1040 lines/millimeter.

To achieve the above-stated broad objectives, the following program procedures will be adopted.

For Resolution Targets.

The achievement of 1040 lines/millimeter will require improvements in projection lenses, materials, and exposure techniques. Since lenses are already on order which may well have the 1040 line capability, it is felt that a major portion of the lens problem may already be solved. A critical look will be taken, however, in view of the resolution desired and it is felt that a back-up lens program should be instituted to assure a better chance of achieving the resolution objective. The back-up program will concentrate on application of existing lenses or lenses which will be available within the next twelve-month period to produce targets of the desired quality and resolution.

The available emulsions are approaching their limits when speaking of high quality 1040 line targets. A program will be undertaken to acquire and test the best of the commercially available emulsions as well as a program to produce light sensitive coatings which will not be limited by present techniques. STATINTL [redacted] has for some time been investigating the new photo-sensitive materials being developed under various government contracts and will apply those which appear promising to the targeting problem. STATINTL [redacted] is also purchasing a new vacuum coating machine using electron beam bombardment. It is felt that vacuum deposition techniques may be a solution to the deposition and thickness control problem of existing coating techniques. The investigation of vacuum deposition of photo-sensitive materials for high resolution will be undertaken as a part of this program.

The last portion of the resolution target problem is the development of techniques for holding the sensitive material, focusing to the required accuracy, and exposing under

vibration free conditions to the proper value, all of which must be done under extremely well-controlled conditions of temperature, humidity, and cleanliness. The last step is, of course, the processing which must also be controlled with the same conditions of cleanliness, temperature, humidity, and necessary chemical control.

STATINTL To meet the last requirement, [redacted] has just completed construction of five laminar flow clean rooms whose performance it is felt exceeds that of any existing facilities of similar nature. A new special step and repeating device to precisely hold the targets for exposure is also presently being constructed and it will be located on a vibration isolated pedestal in the new clean room area. This machine will be available to be used on this development project. Processing facilities are installed in the same clean room area and exposed materials are processed after exposure without being removed from the clean room area.

Items to be Delivered.

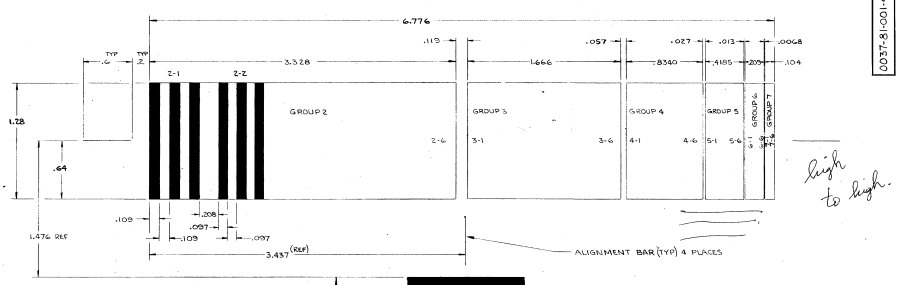
It is felt that the achievements of this program will best be expressed by the delivery of standards which will indicate the progress made on the program. It is accordingly proposed that resolution target standards of the present series will be delivered as near the beginning of the program as possible, these standards to be used for testing existing equipments and training personnel in the use of such standards. Such a program will permit the incorporation of desired changes in the standards for the final items to be delivered. Field use of such standards frequently lead to desirable changes, particularly when such standards are used to test equipments having characteristics different than those for which the original standards were designed.

Final items to be delivered will be standards of resolution, density, and linear measurement representing the maximum achievable performance obtained during the contract. These items would furnish adequate testing and evaluation standards to not only measure the progress of the program but to supply standards which will be useful to the test and evaluation of the next generation of micro-densitometers, microanalyzers, image evaluation equipments, interpretation equipment, microscopes, and special projection equipments.

0037-81-001-40

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	CHG 1.28 WAS 1.24, .64 WAS .63	12-26-63	

STATINTL



GROUP	LINES/MM
2-1	4.56
2-2	5.11
2-3	5.77
2-4	6.48
2-5	7.28
2-6	8.11
3-1	9.12
3-2	10.10
3-3	11.57
3-4	12.98
3-5	14.58
3-6	16.24
4-1	18.24
4-2	20.47
4-3	23.15
4-4	25.88
4-5	29.13
4-6	32.49
5-1	36.48
5-2	40.94
5-3	46.31
5-4	51.97
5-5	58.27
5-6	64.99
6-1	72.96
6-2	81.89
6-3	92.64
6-4	103.94
6-5	116.55
6-6	129.99
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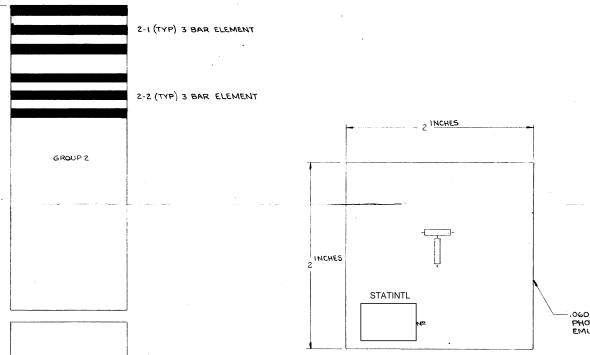
7-2	163.79
7-3	185.29
7-4	207.89
7-5	233.11
7-6	259.99

520



DATA "T" TARGET
SCALE 50 × 1

SCALE 2 × 1

NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

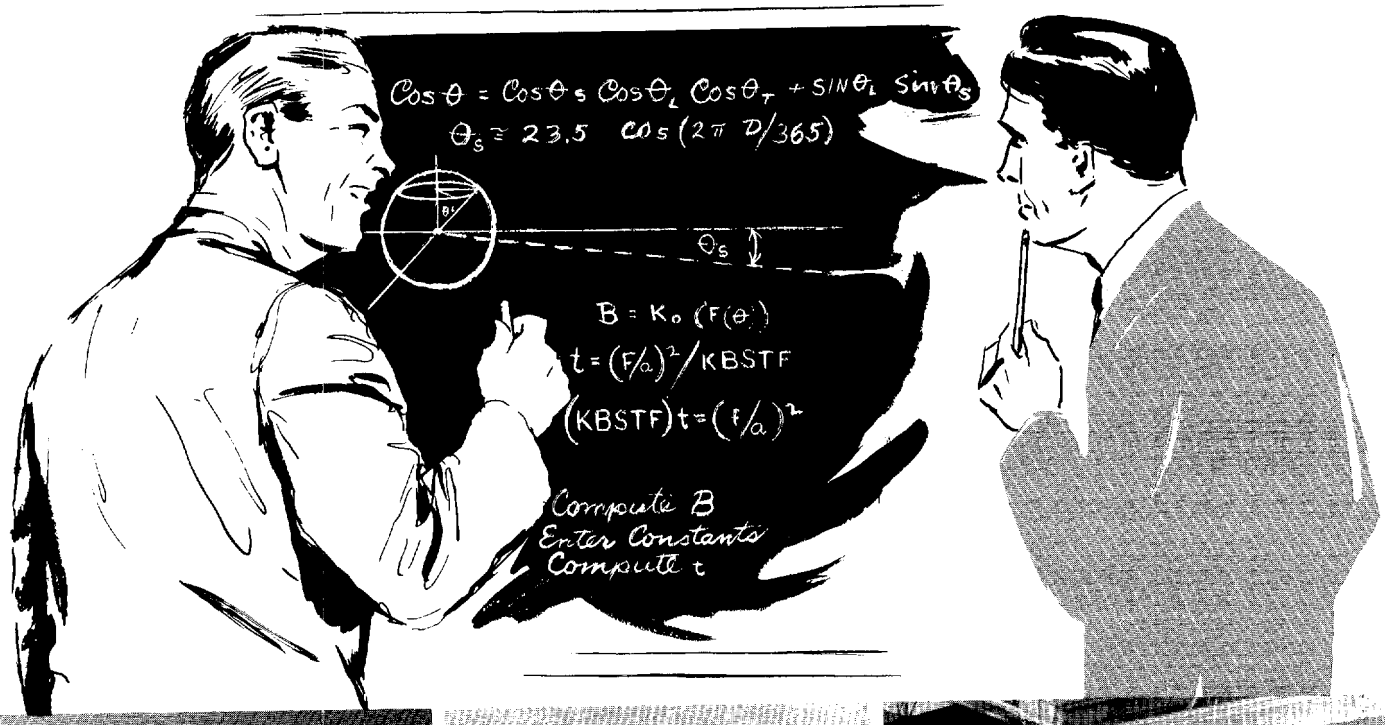
240
900
1040

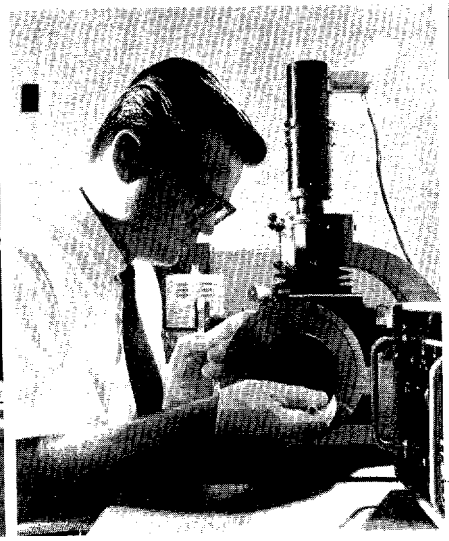
STATINTL STATINTL

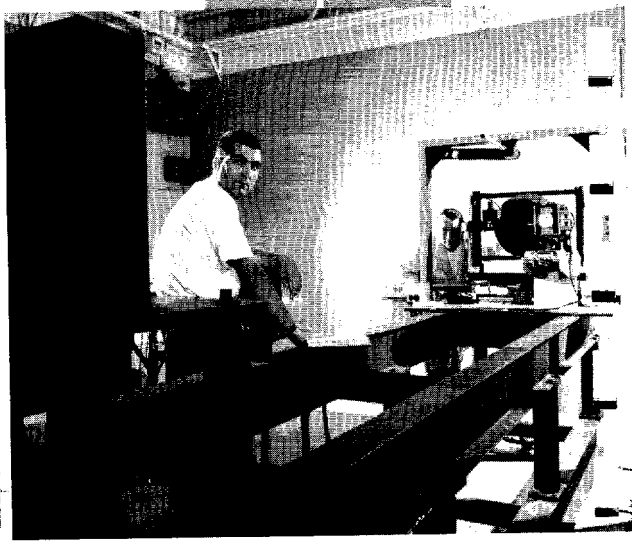
MATERIAL DESCRIPTION	MATERIAL SPECIFICATION	DRAWN BY	CHECKED BY	APPROV BY	
					NEXT ASSEMBLY / MODEL
		8/27/63	8-28-63		APPLICATION
TOL UNLESS OTHERWISE SPEC	MATERIAL SIZE				CODE IDENT NO 11206
DECIMALS FRACTIONS ANGLES	FINISH SPEC	TITLE: DATA "T" TARGET			DRAWING NUMBER 0037-81-001-40
SCALE / WEIGHT					SHEET 1 OF 1

STATINTL

STATINTL







Systems Analysis

The Applied Research Department is equipped with an IBM 1620 digital computer and a [redacted] GEDA L-2 analog computer for systems analysis projects. A highly trained staff of senior engineers are available to develop mathematical models of systems, design programs and analyze requirements in the fields of reconnaissance, guidance and control, and space systems instrumentation.

STAT

STATINTL

Photometric Standards

[redacted] engineers have wide experience in development of specialized primary and secondary standards, including master resolution targets, density standards, measurement standards and special instrumentation involving measurement of light intensity and color temperature.

Optical Laboratories

The Test and Evaluation Department optical laboratories are equipped with a 120-inch Collimator, light and color temperature measurement standards, an integrating sphere and complete accessory instrumentation for work in optics, laser applications, infrared and general photographic and photometric projects.

STATINTL

Organized exclusively to work in these fields:

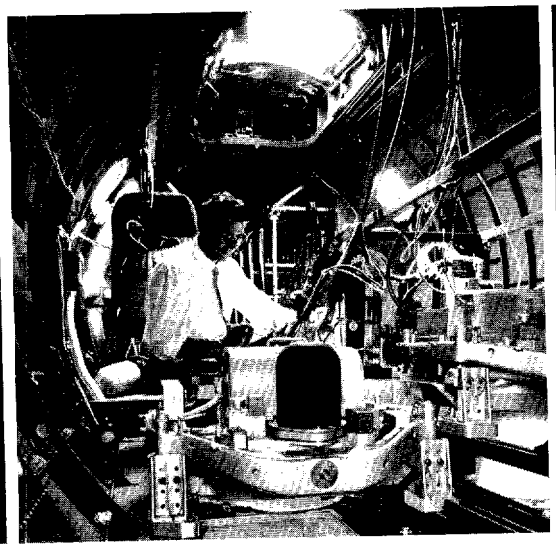
- Applied Research and Development
- Theoretical and Experimental Research
- Advanced Systems Analysis and Planning
- Test and Evaluation

THE ENGINEERS and SCIENTISTS

STATINTL of [redacted] are dedicated to applying the full resources of modern science and technology to advance the state-of-the-art in the fields of reconnaissance and intelligence systems, guidance and control equipment and space systems instrumentation. They are unhindered by production problems, completely free in their choice of equipment and qualified to provide objective technical leadership.

STATINTL [redacted] has purposely refrained from production activity, in order to maintain its position of objectivity and to assure the rendition or exercise of unbiased judgment.

Our engineering staff represents a cross section of the technologies required in these complex fields. It includes mechanical, electrical and electronic engineers and designers, theoretical physicists, photographic scientists, logical systems designers, applied mathematicians, computer programmers and photo interpreters. These are seasoned men with heavy experience in their specialties.



Photographic Science

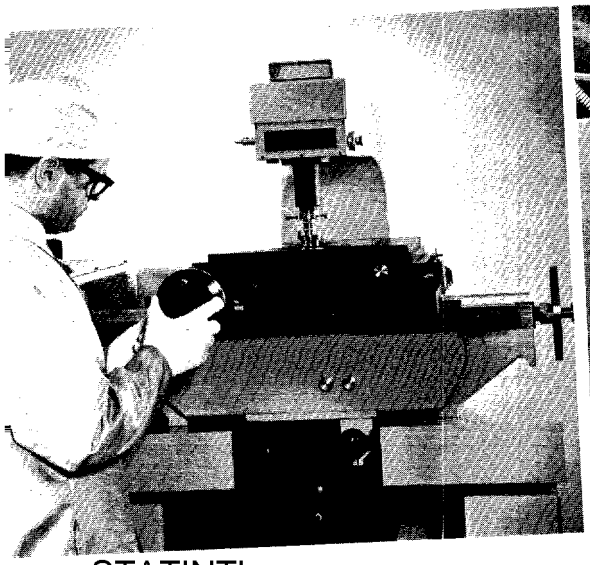
STAT Four laboratories are used for applied research and application engineering in sensitized materials. Equipment includes an [redacted] lb sensitometer, sensitometric processors, densitometers, a recording microdensitometer, a resolution sensitometer, automatic continuous processors, automatic printers and complete accessory equipment.

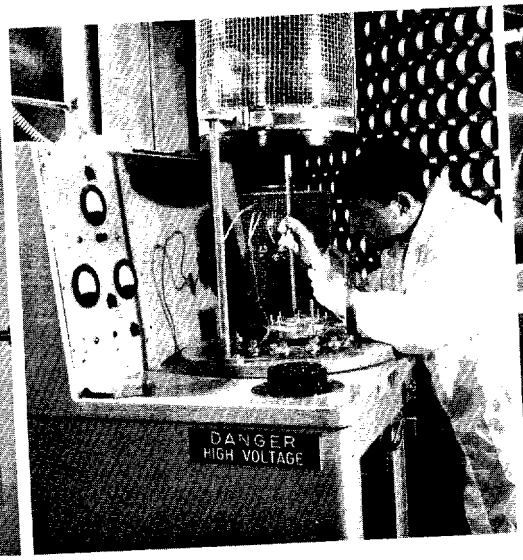
Flight Test

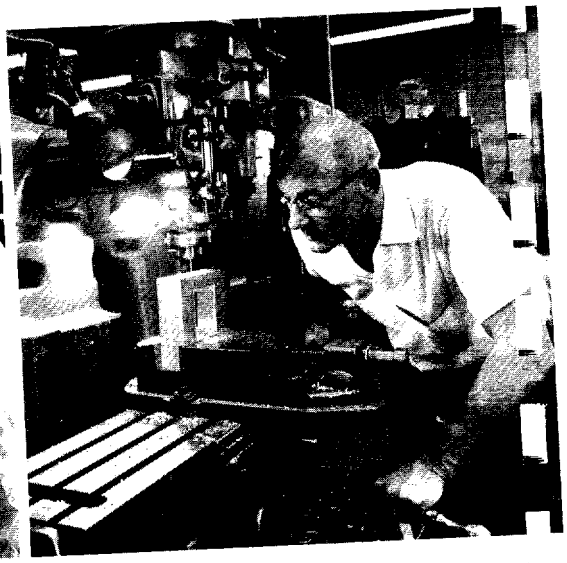
The Systems Engineering Department is equipped to plan and carry out complete intelligence subsystem design and flight test programs, including the design and fabrication of electrical and electronic instrumentation and special mounts, modification of aircraft, flight testing and processing and analysis of flight test data.

Systems Engineering

The senior engineering staff is uniquely qualified by long experience in their various fields to serve as technical program managers in the development of aerial reconnaissance and intelligence devices. Their accomplishments include technical management of airborne subsystem development projects and supporting ground systems.







STATINTL

Instrumentation Design

[redacted] engineers have specialized in the design of highly accurate and complex electro-optical instruments, including micro-densitometers, high altitude scanners, spatial frequency sensors and photographic recording equipment.

Vacuum Plating Equipment

The laboratory is equipped to produce special mirrors, prisms, lens coatings, neutral density filters and similar products requiring the utilization of metal evaporation techniques.

Model Shop Facilities

The engineering laboratory includes a complete model shop, equipped with horizontal and vertical milling machines, shapers, engine lathes, second operation lathes, grinders, sheet metal forming equipment, welding and brazing equipment and heat treating facilities.

CLEAN ROOM FACILITIES

STATINTL

In keeping with [redacted] continuing effort to maintain the ultimate in reconnaissance test and evaluation equipment, our facilities include six [redacted] (considered superior to Class 4) clean rooms containing 520 cubic feet of working space. These rooms remove 99.97 percent of all particles larger than 0.3 microns. Two of these rooms contain photosensitive processing equipment, and all rooms are capable of total dark operation. The rooms are equipped with associated measuring standards and equipment in the micro region. An additional 440 square feet of Class 2 area is available for more routine clean activities.

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STATINTL

With the addition of these clean room facilities, [redacted]s in a position to provide its customers with the finest environmental control available for applied research and testing problems.

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Approved For Release 2003/08/04 : CIA-RDP78B04747A001200030001-5

TECHNICAL PROPOSAL

SPECIAL TARGETS
for
INTERPRETATION EQUIPMENT
EVALUATION

27/64

STATINTL

TECHNICAL PROPOSAL

SPECIAL TARGETS
FOR
INTERPRETATION EQUIPMENT EVALUATION

STATINTL

[redacted]

January 8, 1964

STATINTL

[redacted]

TECHNICAL PROPOSAL

SPECIAL TARGETS FOR INTERPRETATION EQUIPMENT EVALUATION

STATINTL [redacted] has been producing a series of standards for calibration and evaluation of micro-densitometers, microanalyzers, viewers and related equipments used in photographic image evaluation. The present series of standards fall in three categories. These categories are standards for (1) resolution, (2) density, (3) linear measurement. The first category is shown in drawing No. 0037-81-001-40 and is known as a T target. The basic bar size ratio was chosen as $\sqrt[6]{2}$ in order to maintain a tie with the MIL-STD-150 target which is basically a manually read target. The bar lengths of the T target have been made long to permit micro-densitometers to read the bar density with the slit lengths required in the older machines. The two sets of targets at right angles permit detection of directional effects when such systems as printers or processors are analyzed. The T target can be made in any contrast ratio desired on either film or glass within the limitations of the sensitive materials.

It should be pointed out that definition of resolution for master targets as used STATINTL at [redacted] means that the density between bars is less than 20% of the density of the bar itself. Currently, 260 line/millimeter targets made on glass with 649GH have a value of density between bars of less than 5% of the value of the bar density. The T targets are made by exposing each group of three elements separately--only by this technique can the exposure of a series of varying sizes be maintained to provide constant bar density to the limits of the material being exposed. Lenses used to expose

STATINTL [redacted]

the material are flat field, four color, specially selected lenses with a low convergency angle. It is most important that the convergency angle be as small as possible since the ability to define a sharp edge depends on exposing as thin an emulsion as possible with as nearly collimated vertical light as possible. It is felt that the present lenses represent the highest existing state-of-the-art for the producing of master targets on photographic materials. A new series of lenses using ultraviolet are on order and will be used to extend the resolution capability of the photographic method of target production. Masters for producing 520 lines/millimeter are available at STATINTL Preliminary tests have been made, but there is not sufficient data to indicate the characteristics of the 520 line target.

The second category of standards are step wedges having the size indicated in drawing No. 0037-81-003-30. The sizes have again been chosen to permit calibration of older micro-densitometers requiring large slit areas to read density. A complete density standard to be used on a micro-densitometer requires a density conversion means to give an equivalent diffuse density reading if the density value is to be useful for photographic purposes. To accomplish the conversion it is necessary that the material being read be the same or very nearly the same as the standard step wedge. The basic reason being that since all micro-densitometers use essentially spectral light they would be reading a spectral rather than a diffuse density and spectral values can vary as much as 50% from diffuse values depending on the structure of the material being read. It is therefore recommended that if a high order of accuracy is required in terms of diffuse density, that a step wedge be made for each type of material to be

read and that the micro-densitometer be calibrated before reading the specimen with the proper step wedge. It has been found that the optimum accuracy is obtained when the master step wedge is processed in the same manner as the specimens to be read.

A master density step wedge set consists of the miniature step wedge, a standard step wedge, both made of the same material as the type to be read and processed in the same manner, if possible. Also included is a diffuse density reading of the standard step wedge and a Microanalyzer trace of both wedges with the calibration values indicated for each step. The complete group is known as a micro-densitometer master density calibration set. Included on the miniature step wedge is a focusing target and a triggering step preceding the calibrated steps. The triggering step is used on automated D Log E plotting routines. The steps of the miniature step wedge are exposed individually and edge sharpness is maintained to permit the use of the wedge edges as master edge measurement standards. Calibrations of each edge can be furnished when desired. Wedges can be made on film or glass.

The third category are linear measurement standards, drawing No. 0019-87-003-20, which serve to establish the absolute measurement capability of scanning densitometers or projection devices. These standards are tailored to specific measuring requirements. They are made on quartz by engraving away deposited metal films. Control of line widths as well as spacing is maintained to permit a large range of calibration procedures. Glass negatives of such standards are also made from which film positives can be made to conduct various tests on film stability characteristics.

While the above listed standards meet most of the requirements for present day imagery and equipment evaluation, it is evident that in the near future a considerably

improved series of standards will be required to evaluate the next generation of equipments. It is accordingly proposed that an R & D effort be funded to permit improvement of standards to a higher order of performance that appear achievable without resorting to drastic changes in techniques for improvement. It is felt that a twelve-month research effort will produce standards capable of achieving the following broad objectives.

Resolution Targets to 1040 lines/millimeter.

Density Standards to a 1% absolute density value.

Linear Measurement Standards to .0001%.

To achieve the above-stated broad objectives, the following program procedures will be adopted.

For Resolution Targets.

The achievement of 1040 lines/millimeter will require improvements in projection lenses, materials, and exposure techniques. Since lenses are already on order which may well have the 1040 line capability, it is felt that a major portion of the lens problem may already be solved. A critical look will be taken, however, in view of the resolution desired and it is felt that a back-up lens program should be instituted to assure a better chance of achieving the resolution objective. The back-up program will concentrate on application of existing lenses or lenses which will be available within the next twelve-month period to produce targets of the desired quality and resolution.

The available emulsions are approaching their limits when speaking of high quality 1040 line targets. A program will be undertaken to acquire and test the best

STATINTL

of the commercially available emulsions as well as a program to produce light sensitive coatings which will not be limited by present techniques. [redacted] has for some time been investigating the new photo-sensitive materials being developed under various government contracts and will apply those which appear promising to the targeting problem. [redacted] is also purchasing a new vacuum coating machine using electron beam bombardment. It is felt that vacuum deposition techniques may be a solution to the deposition and thickness control problem of existing coating techniques. The investigation of vacuum deposition of photo-sensitive materials for high resolution will be undertaken as a part of this program.

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The last portion of the resolution target problem is the development of techniques for holding the sensitive material, focusing to the required accuracy, and exposing under vibration free conditions to the proper value, all of which must be done under extremely well-controlled conditions of temperature, humidity, and cleanliness. The last step is, of course, the processing which must also be controlled with the same conditions of cleanliness, temperature, humidity, and necessary chemical control.

To meet the last requirement, [redacted] has just completed construction of five laminar flow clean rooms whose performance it is felt exceeds that of any existing facilities of similar nature. A new special step and repeating device to precisely hold the targets for exposure is also presently being constructed and it will be located on a vibration isolated pedestal in the new clean room area. This machine will be available to be used on this development project. Processing facilities are installed in the same clean room area and exposed materials are processed after exposure without being removed from the clean room area.

Density Standards.

To achieve the 1% accuracy required for new density standards will require the same equipments and areas as outlined above for resolution standards, plus the manufacturing and calibration of a master set of density standards for each material for which a master density step wedge is desired. In order to meet the 1% density accuracy the master standards must be calibrated by transmission in a light standards laboratory. This laboratory is available at STATINTL [redacted] Master reference is against the Bureau of Standards Light Reference Standard.

Linear Measurement Standards.

The precise size and shape of the linear standards can vary widely. However, the calibration of the standard is the prime requirement. STATINTL [redacted] has under contract the construction of a precision scanning Microanalyzer which will have the ability to scan and read out edge to edge measurements to an accuracy of 0.1 micron. This machine will be used to calibrate the linear calibration standards anticipated on this program.

Items to be Delivered.

It is felt that the achievements of this program will best be expressed by the delivery of standards which will indicate the progress made on the program. It is accordingly proposed that target standards of the present series will be delivered as near the beginning of the program as possible, these standards to be used for testing existing equipments and training personnel in the use of such standards. Such a program will permit the incorporation of desired changes in the standards for the final items to be delivered. Field use of such standards frequently lead to desirable changes, particularly when such standards are used to test equipments having characteristics different than

those for which the original standards were designed.

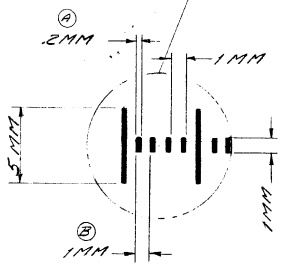
Final items to be delivered will be standards of resolution, density, and linear measurement representing the maximum achievable performance obtained during the contract. These items would furnish adequate testing and evaluation standards to not only measure the progress of the program but to supply standards which will be useful to the test and evaluation of the next generation of micro-densitometers, microanalyzers, image evaluation equipments, interpretation equipment, microscopes, and special projection equipments.

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVAL

0019-87-003-20

DO NOT SCALE DRAWINGS
BREAK ALL SHARP CORNERS
UNLESS OTHERWISE SPECIFIED

STATINTL



NOTES:
METRIC SCALE: 1 LARGE DIVISION EACH 1/2 CENTIMETER, SMALL DIVISION EACH MILLIMETER
(A) TOLERANCE ON WIDTH OF GRID MARKS ±.1M
(B) LINEARITY TOLERANCE ON SCALE ±.1M OVER 5 CENTIMETER LENGTH
ALL EDGES TO BE PARALLEL AND STRAIGHT

STATINTL

SYM.	QUAN.	NOMENCLATURE	MANUFACTURER	MFG. No. OR MIL No.

MATERIAL DESCRIPTION	MATERIAL SPECIFICATION	MATERIAL SIZE	DRAWN BY	CHECKED BY	APPROV. BY	APPROV. BY
		STATINTL	1-19-62			

TOL. UNLESS OTHERWISE SPEC.	HEAT TREAT SPEC.
DECIMALS ± .005 FRACTIONS ± 1/64 ANGLES ± 1/2°	HARDNESS
	FINISH SPEC.

NEXT ASSEMBLY	MODEL	QUAN. REQ. NEXT ASSY.
FIRST USED ON		

SCALE	WEIGHT	DWG. SIZE
NONE		B

MASTER DIMENSION REFERENCE

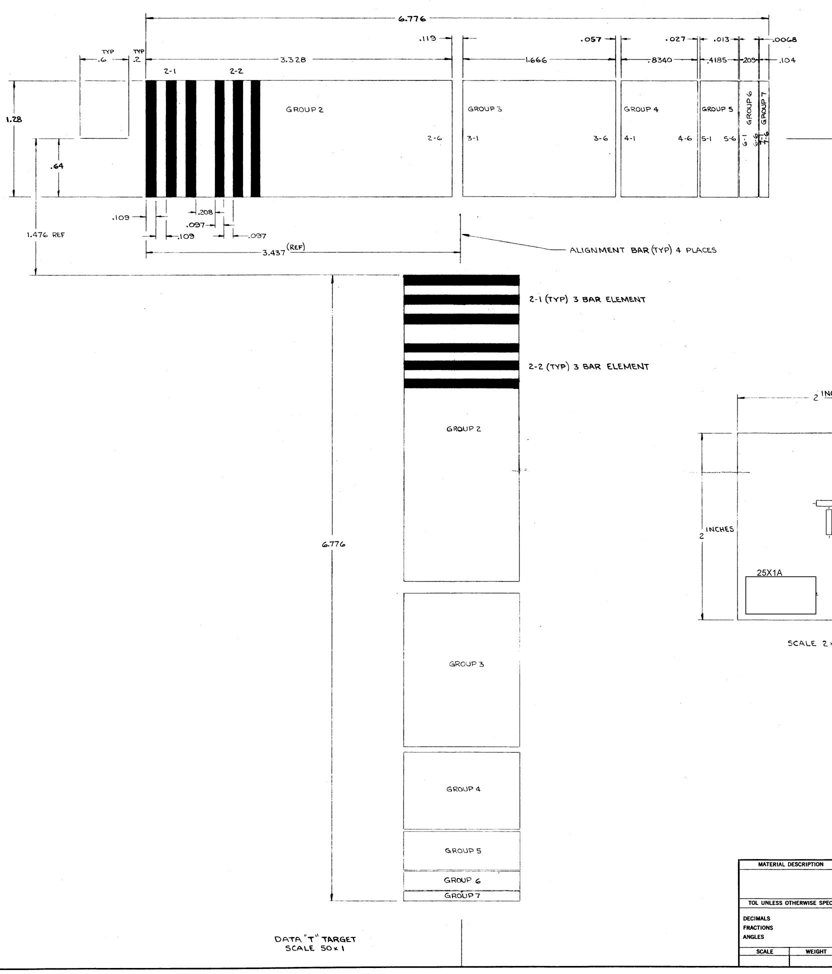
DRAWING NUMBER: 0019-87-003-20

STATINTL

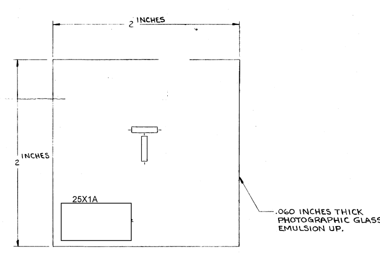
0037-81-001-40

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	CHG: 1.28 WAS 1.26, .64 WAS .63	12-26-63	

25X1A



GROUP	LINES/MM
2-1	4.56
2-2	5.11
2-3	5.77
2-4	6.48
2-5	7.28
2-6	8.11
3-1	9.12
3-2	10.10
3-3	11.57
3-4	12.98
3-5	14.58
3-6	16.24
4-1	18.24
4-2	20.47
4-3	[illegible]
4-4	25.98
4-5	29.13
4-6	32.49
5-1	36.48
5-2	40.94
5-3	46.31
5-4	51.97
5-5	58.27
5-6	64.99
6-1	72.96
6-2	81.89
6-3	92.64
6-4	103.94
6-5	116.55
6-6	129.99
7-1	145.92
7-2	163.79
7-3	185.29
7-4	207.89
7-5	233.11
7-6	259.99



SCALE 2×1

NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

DATA "T" TARGET
SCALE 50×1

STATINTL

25X1A

MATERIAL DESCRIPTION	MATERIAL SPECIFICATION	DRAWN BY	CHECKED BY	APPROV BY	NEXT ASSEMBLY	MODEL
		8/27/63	8-28-63		APPLICATION	
TOL UNLESS OTHERWISE SPEC	MATERIAL SIZE	25X1A			CODE IDENT NO 11266	
DECIMALS FRACTIONS ANGLES	FINISH SPEC	TITLE "T" TARGET			DRAWING NUMBER 0037-81-001-40	
SCALE / WEIGHT					SHEET 1 OF 1	

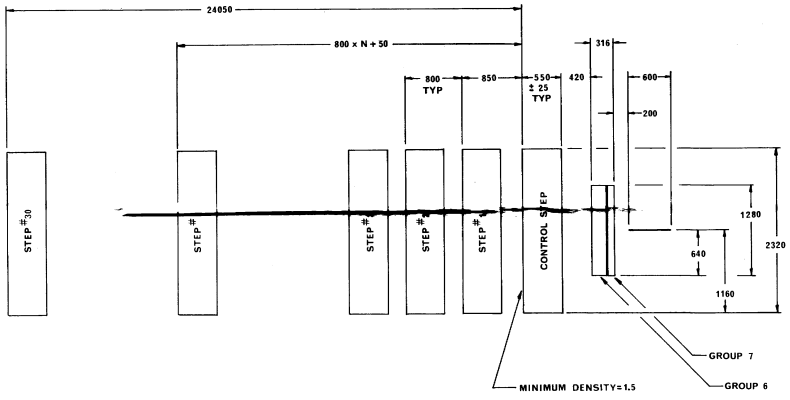
STAT

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

STATINTL

FILM TYPE

WEDGE NUMBER

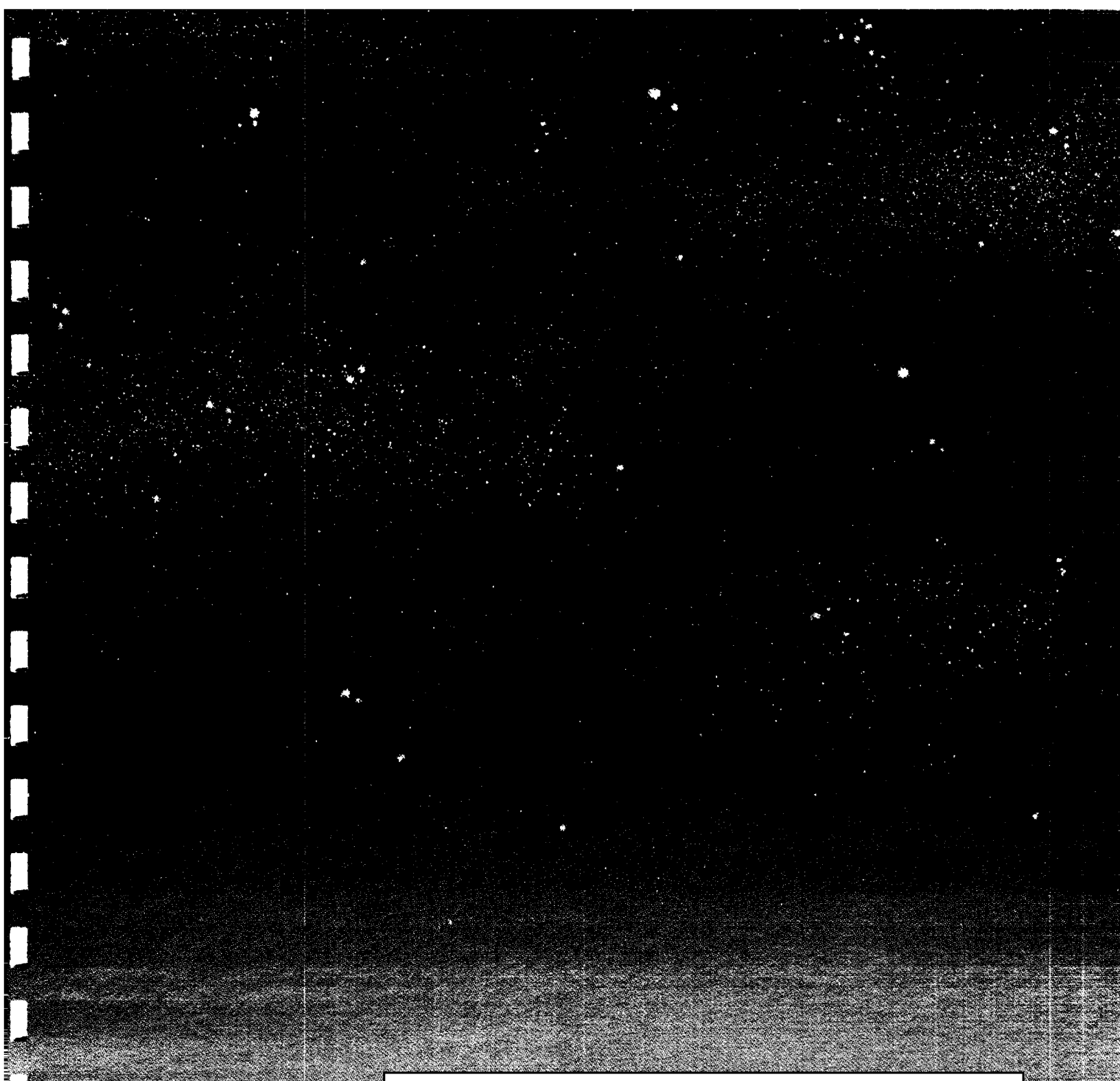


NOTE:
ALL DIMENSIONS ARE IN MICRONS.

STATINTL STATINTL

MATERIAL DESCRIPTION	MATERIAL SPECIFICATION	DRAWN BY	CHECKED BY	APPROV BY		
					NEXT ASSEMBLY	MODEL
		1-7-64	1-7-64		APPLICATION	
TOL UNLESS OTHERWISE SPEC	MATERIAL SIZE					CODE IDENT NO 11266
DECIMALS FRACTIONS ANGLES	FINISH SPEC	TITLE STATINTL MICRO STEP WEDGE				DRAWING NUMBER 0037-81-003-30
SCALE / WEIGHT						SHEET 1 OF 1

STATINTL



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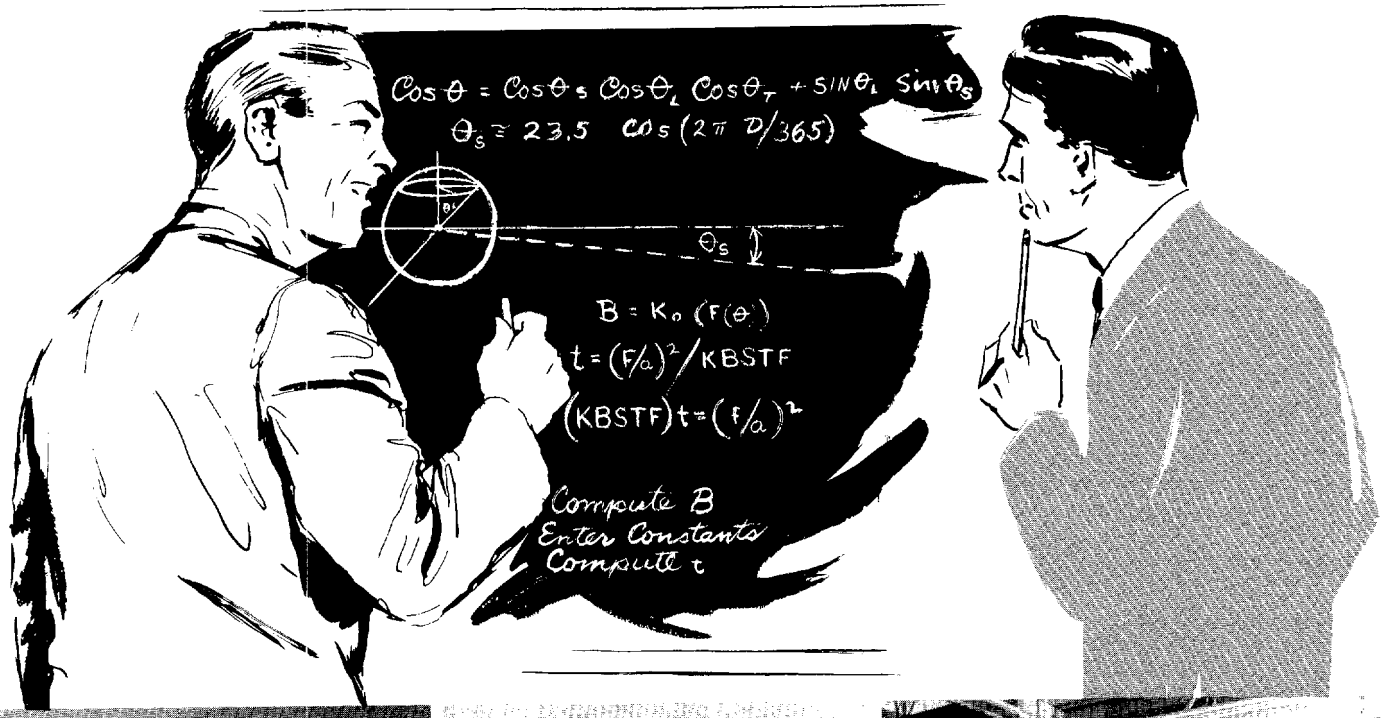

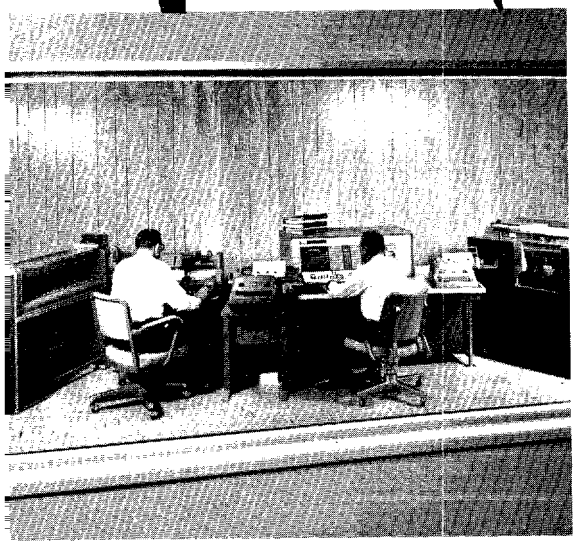

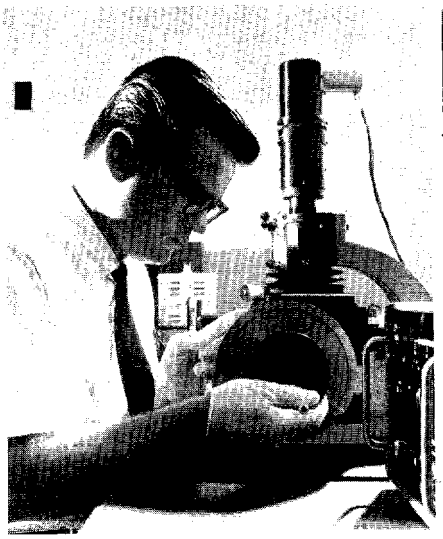

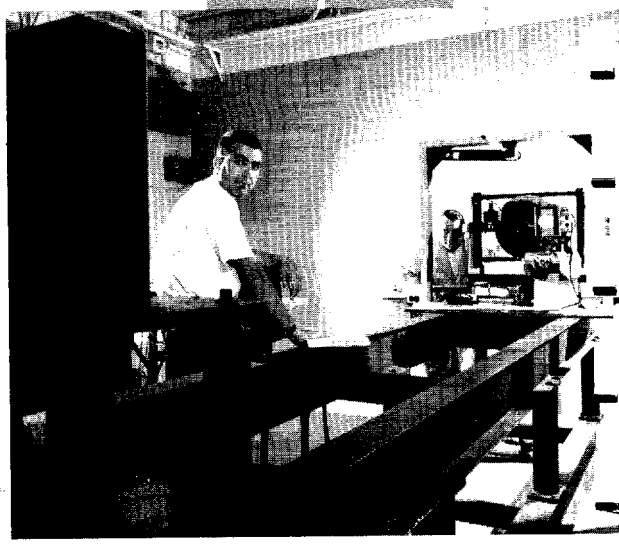

Systems Analysis

The Applied Research Department is equipped with an IBM 1620 digital computer and a [redacted] GEDA L-2 analog computer for systems analysis projects. A highly trained staff of senior engineers are available to develop mathematical models of systems, design programs and analyze requirements in the fields of reconnaissance, guidance and control, and space systems instrumentation.

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Photometric Standards

[redacted] engineers have wide experience in development of specialized primary and secondary standards, including master resolution targets, density standards, measurement standards and special instrumentation involving measurement of light intensity and color temperature.

Optical Laboratories

The Test and Evaluation Department optical laboratories are equipped with a 120-inch Collimator, light and color temperature measurement standards, an integrating sphere and complete accessory instrumentation for work in optics, laser applications, infrared and general photographic and photometric projects.

STATINTL

Organized exclusively to work in these fields:

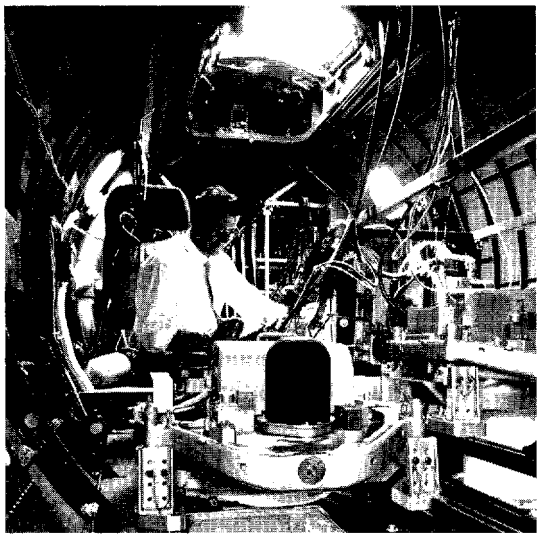
- Applied Research and Development
- Theoretical and Experimental Research
- Advanced Systems Analysis and Planning
- Test and Evaluation

THE ENGINEERS and SCIENTISTS

STATINTL of [redacted] are dedicated to applying the full resources of modern science and technology to advance the state-of-the-art in the fields of reconnaissance and intelligence systems, guidance and control equipment and space systems instrumentation. They are unhindered by production problems, completely free in their choice of equipment and qualified to provide objective technical leadership.

STATINTL [redacted] has purposely refrained from production activity, in order to maintain its position of objectivity and to assure the rendition or exercise of unbiased judgment.

Our engineering staff represents a cross section of the technologies required in these complex fields. It includes mechanical, electrical and electronic engineers and designers, theoretical physicists, photographic scientists, logical systems designers, applied mathematicians, computer programmers and photo interpreters. These are seasoned men with heavy experience in their specialties.



Photographic Science

STAT Four laboratories are used for applied research and application engineering in sensitized materials. Equipment includes an [redacted] lb sensitometer, sensitometric processors, densitometers, a recording microdensitometer, a resolution sensitometer, automatic continuous processors, automatic printers and complete accessory equipment.

Flight Test

The Systems Engineering Department is equipped to plan and carry out complete intelligence subsystem design and flight test programs, including the design and fabrication of electrical and electronic instrumentation and special mounts, modification of aircraft, flight testing and processing and analysis of flight test data.

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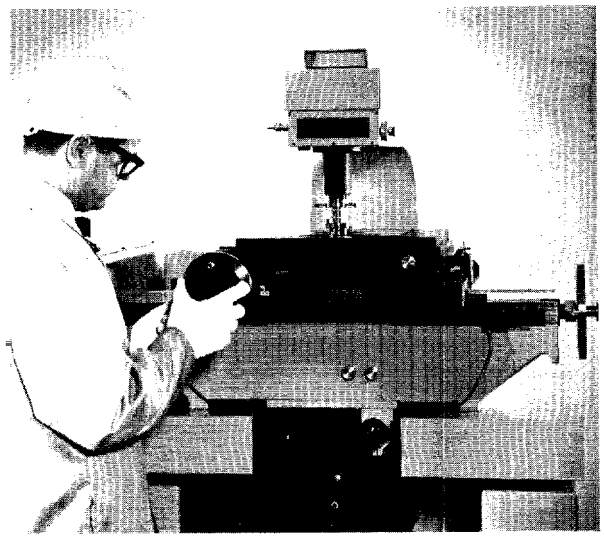

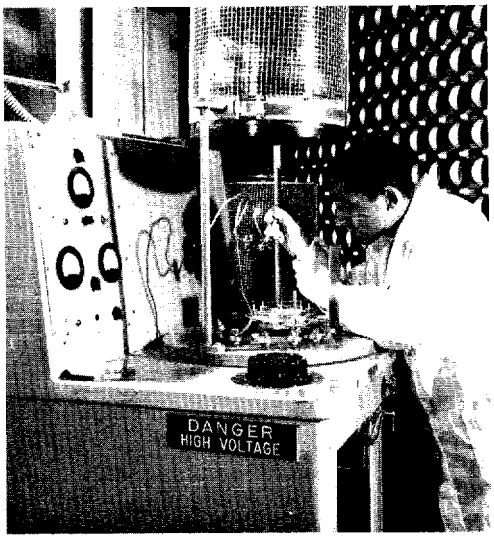

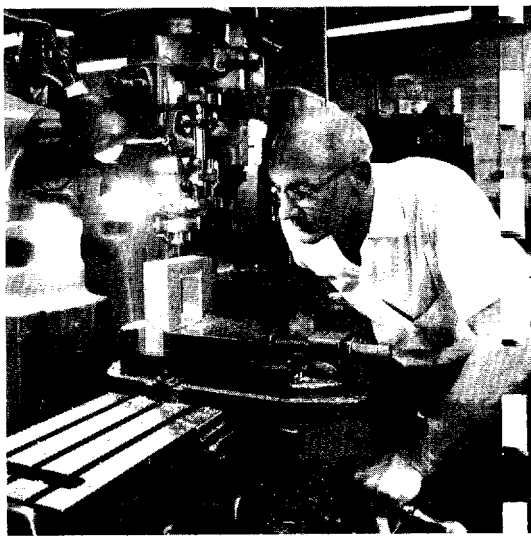

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STATINTL

Litho in U.S.A.

STATINTL

Approved For Release 2003/08/04 : CIA-RDP78B04747A001200030001-5

UNSOLICITED

TECHNICAL PROPOSAL

INTERPRETATION
EQUIPMENT
EVALUATION
TARGETS

Approved For Release 2003/08/04 : CIA-RDP78B04747A001200030001-5

STATINTL [redacted]

1/9/65
4 Copies Reed

June 9, 1965

STATINTL [redacted]

STATINTL [redacted]

We are pleased to submit four (4) copies of our proposal pertaining to Interpretation Equipment Evaluation Targets for your consideration. This proposal covers research and experimentation with standards for calibration and evaluation of microdensitometers, microanalyzers, viewers and related equipment used in photographic image evaluation. The purpose of the proposal is to provide techniques for producing high quality, high line frequency targets for a minimum of cost, on glass or film.

We recommend a performance period of twelve (12) months to accomplish the required work. We estimate a total amount of [redacted] will be required to fund the proposal as written. We have contemplated several engineering tasks and would be glad to price out specific tasks if this would better satisfy your budgetary requirements. STAT

I hope this meets all of your requirements. If you have any questions please contact the undersigned.

STATINTL
Sincerely,

[redacted]

REW/wmt

179/65

STATINTL

UNSOLICITED

TECHNICAL PROPOSAL

INTERPRETATION EQUIPMENT EVALUATION TARGETS

STATINTL

Submitted: 9 June 1965

The data set forth herein is submitted as an unsolicited proposal and shall not be disclosed outside the Government or be duplicated, used or disclosed in whole or in part for any purpose other than to evaluate the proposal; provided, that if a contract is awarded to this offeror as a result of or in connection with the submission of such data, the Government shall have the right to duplicate, use, or disclose this data to the extent provided in the contract. This restriction does not limit the Government's right to use information contained in such data if it is obtained from another source.

SECTION I

INTRODUCTION AND SUMMARY

During the past year we have been engaged in a research program with three major objectives. These are 1) production of resolution targets on glass plates which go to at least 1000 lines per millimeter, 2) density calibration of targets of high line frequency and 3) production of resolution targets on film which go up to at least 1000 lines per millimeter.

Priority was given to these tasks in the above order. Consequently, as a result of the past program we plan to deliver three glass targets before the end of the contract period, with uncorrected microdensitometer traces. Time has not permitted work on the film targets.

In order to produce these targets it was necessary to upgrade each step in the production process, over the level necessary for our standard 260 lines per millimeter targets. On the targets produced we were able to achieve adequate quality at 1000 lines per millimeter, however we feel that this is not the best that can be done with the equipment now available and improved techniques.

We propose a follow-on program which will provide techniques for producing high quality, high line frequency targets for a minimum of cost, on glass or film. We believe we will also be able to accurately calibrate high line frequency targets on glass or film.

Further we propose that dye image targets may be used to investigate the resolution of color printing systems to the three primary additive colors (red, green blue).

SECTION 2
TECHNICAL DISCUSSION

To further improve the production process, we propose a follow up program for the next twelve month period. The first task will be production of film targets. Following this, work will be done on improving the exposing equipment, processing formulas, chemical improvement of available emulsions, and target calibration research.

In detail then, the areas of work for this program are:

1. Production of the above mentioned targets on film, to the same quality level as the delivered glass targets. In the past we have produced resolution targets on film which go to 520 lines/millimeter. Based on our experience with these film targets, we feel that there are three problem areas. These are 1), a suitable means for holding the film to the required flatness for exposure, 2) holding the film in the spray processor, and 3) exposure determination. Holding the film flat while exposing is the only major problem with the 40X lens we found that the depth of focus is 25 microinches.

For the 520 lines per millimeter film targets we use a machined mehanite blank with a suitable hole pattern for vacuum holdown. This was only made to 0.1 mil flatness, which is not acceptable for this task. A new vacuum platen must be made, to higher flatness for these film targets.

We have also used air pucks for film holdown, but these would not be satisfactory for oil immersion lenses or the air gauge.

2. The testing and target production used a point light source arc lamp, with a Wratten 45 (blue) filter. Exposures with this setup produce surface latent images. We plan to investigate the use of a flash tube, with small arc size. Flash exposures produce internal latent images, which may yield higher quality targets with reduced grain sizes.

The problem with the flash lamp is in obtaining close control on the intensity-time product. If a precision regulated power supply and quality capacitors do not give

adequate repeatability, an integrating exposure control system will be constructed.

3. The targets were made with a 40X lens, at 36.5/1 reduction ratio. This meant that the tube length was less than the standard 160 mm. Tests should be run at standard tube length with the present objective lens, to determine if improved performance will result. Other high quality objectives will be tested.

In the original program proposal, mention was made of trying ultraviolet lenses. Thus far we have not been able to find any UV lenses of sufficiently high numerical aperture to be usable.

Four major areas of investigation should be explored for improving the quality of the target images through the use of photographic chemistry. These are 1) optical sensitization of existing emulsions, 2) developer formulation to improve speed, acuity and resolution of existing emulsions, 3) protective overcoatings for image standards, and 4) production of dye image targets in any of the three subtractive primaries or neutral hues. All of the aforementioned areas have been subjected to limited chemical scouting research and appear feasible as well as advantageous to the production of high resolution targets.

Optical Sensitization

During the past program we have used [redacted] 649-GH glass plates. The STAT processed emulsion thickness is about five microns, which is very thick for high line frequency work. The printed bar in the 1040 lines/mm group is approximately one half micron wide, and probably this thickness in the emulsion, based on the high numerical aperture of the printing and viewing objectives. Assuming this to be true the image is formed in the top 10-20% of the emulsion layer. Critical control of the focusing limits the projected image to this upper surface of the emulsion.

STATINTL Preliminary tests here at [redacted] and a doctors thesis by P. Kowaliski in Zurich, Switzerland, 1944, indicate that significant increases in printing resolution may be obtained through the use of optical sensitization, principally using image attenuation or sharpening dyes. Sensitizers of this type are represented by tartrazine, penacyanol and acid salts of catonic molecules. Use of such dyes in high resolution thin emulsions will absorb flare or non image forming light, increase scattering in the

emulsion as well as limit the image depth in the emulsion. The mechanism of absorption and resulting image attenuation is such that the smaller bars, which are more nearly on the emulsion surface, show increased resolution. However, the larger bars which are printed in the entire emulsion layer show a slight loss in density.

Developer Formulation

Since the physical shape, size, color, concentration and placement of the silver grains determines the end result of the high resolution target, the type of development and associated kinetics in producing the grains is of utmost importance. Silver grains which are nearly the same size and shape as the original silver halide particles are probably the most desirable end result for obtaining fine grain, high resolution targets. The type of developer determines markedly the characteristics of the silver grains. When development is carried out primarily by chemical reduction, as is the case with STAT [redacted] D-19, the grains are larger and more filamentous than the original silver halide particles. A developer which grows the grains at a slow uniform rate, as is seen with solution physical development, has been thought to be the best type. However, recent chemical scouting work on fine grain, high acuity, rapid access developers indicate that finer grain is obtained with increased rate of development in the presence of silver halide solvents and cationic development accelerators. One such formula yielded lower granularity, faster speed and higher gamma than D-19 on a fine grain aerial duplicating film. It is felt more work in this area will be beneficial to producing higher quality targets.

Protective Overcoatings

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Some work has been done to date at [redacted] in producing protective overcoatings for primary image standards. Using two types of emulsifiers, methoxy polyetheylene glycol and hydroxyethyl cellulose as well as plasticizers, overcoatings have been developed which are both insoluble and soluble in aqueous solutions but which are completely insoluble in organics. Such overcoatings could be used to protect the image standards from physical abrassion as well as from oil used in optical printing or tracing systems.

The problem at present is to find a method of coating the "emulsions" on the

existing photographic plates with sufficient uniformity and limited optical density. There are two possible methods, vacuum deposition of the coating, and skim coating.

Dye Image Targets

Two types of chemical systems have been previously investigated for producing high resolution images in color; dye mordanting and color coupling. The dye mordant system appears the least desirable since the hue of the mordant influences the colorant produced. Also, the purity and range of hues available is considerably restricted.

Use of a color coupler system, similar to that employed in the Kodachrome process appears to be the most promising to date. By using a system of this type, primary subtractive colored targets could be produced which have only dye molecules forming the image structure. Chemical fog and contrast are a problem in the magenta and yellow processes respectively. These problems should be corrected by adjusting developing agent concentrations and color coupler ratios, as well as the development accelerators.

To obtain a neutral hue is most difficult chemically, using three primary subtractive dye images, since it involves successive rehalogenation and development and bleaching operations which deteriorate the latent image centers. This problem may be solved using a reversal image to retain a positive master of the original image, which would be used to reprint the image after successive development, bleaching, and rehalogenation steps.

Target Calibration

During the past program research work was carried out with the goal of improving our microdensitometer system, and calibrating the traces to take out the machine characteristics. We were able to reduce the microspot size to below one micron, so that traces could be made of 1000 lines per millimeter. Some progress was made toward compensation of the traces, but this was found to be a bigger task than originally estimated. We are not yet able to compensate the traces.

During the next year, we propose to continue research work on calibration of 1000 lines per millimeter targets. Work will be done in the following three areas:

1) Additional simulation of target tracing on the computer. During the last program some simulation of the 1.1 micron tracing a sharp edge was carried out. Next year we propose to measure the light distribution of other size spots, and simulate edge tracing with these spots.

After the exact nature of the light distribution has been determined, work can begin on compensation of traces.

2) Investigate means for producing smaller tracing spots by:

a) Improve lower pickup optics in the microdensitometer, by procuring a higher numerical aperture lens.

b) Use of blue or blue green light for tracing, instead of white light.

c) Use a point light source arc lamp instead of a tungsten filament bulb. A constant intensity power supply, similar to the one designed for the target exposing system would be required for this experiment. The arc lamp has a smaller light size, as well as high intensity, and high color temperature.

d) Experiment with other projection objectives, both air and oil immersion.

3) Make microdensitometer tracing easier and more repeatable by 1) making use of manual focusing aids, such as a [redacted] air gauge for measuring the STAT lens to emulsion distance, and 2) start research into a system for automatically focusing the microdensitometer.

Summarizing, we propose to work on the following tasks during the next twelve months:

1. Film Targets: Production and calibration of three "L" targets on film. Calibration traces will be supplied with each target.

2. Developer Formulation: Formulation and testing of developers which will produce high gamma, fine grain, low fog and stain.

3. Optical Sensitization: Investigate types of dyes and concentrations required to improve quality of targets at high line frequencies.

4. Flash Exposure: Modify the existing lamphouse, so that exposures can be made with a flash tube. Determine if higher quality targets can be produced with flash exposures.

5. Printing Lenses: Make test targets with at least one other high quality objective lens.

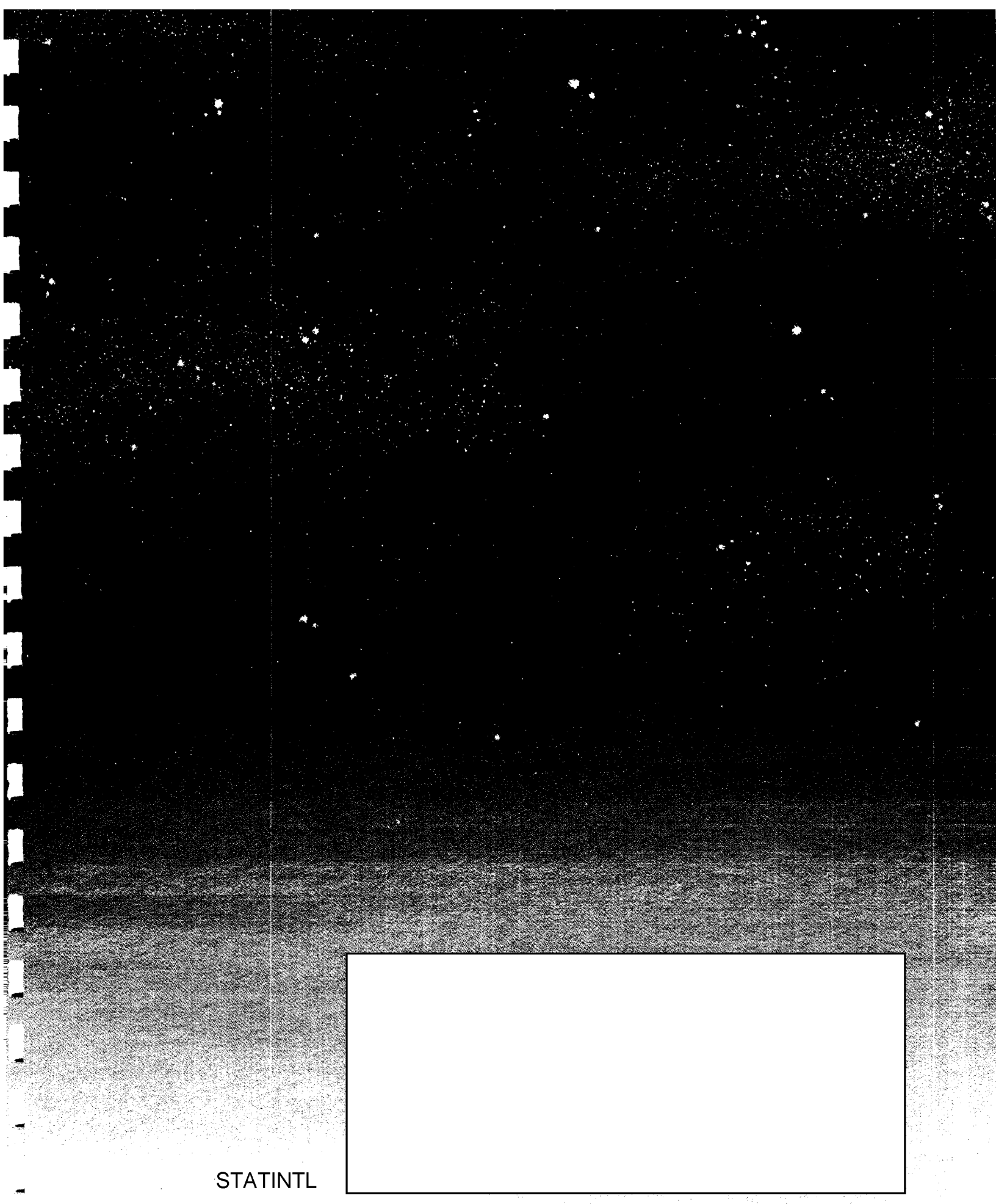
6. Reduction Ratio: Test the present printing lens at one standard tube length (160 mm), and determine if target quality is improved.

7. Protective Overcoatings: Investigate methods of applying coatings to obtain uniform thickness.

8. Dye Image Targets: Produce three dye image targets in each of the three primary subtractive colors, cyan, magenta, and yellow.

9. Target Calibration: Determine a method of compensation of traces, to eliminate the effect of the microdensitometer. Improve the microdensitometer by higher quality lenses and automatic or semiautomatic focusing systems.

10. Utilizing the improved techniques which will come out of the tasks described, we will deliver six targets on glass, 2" x 2" , with calibration traces.



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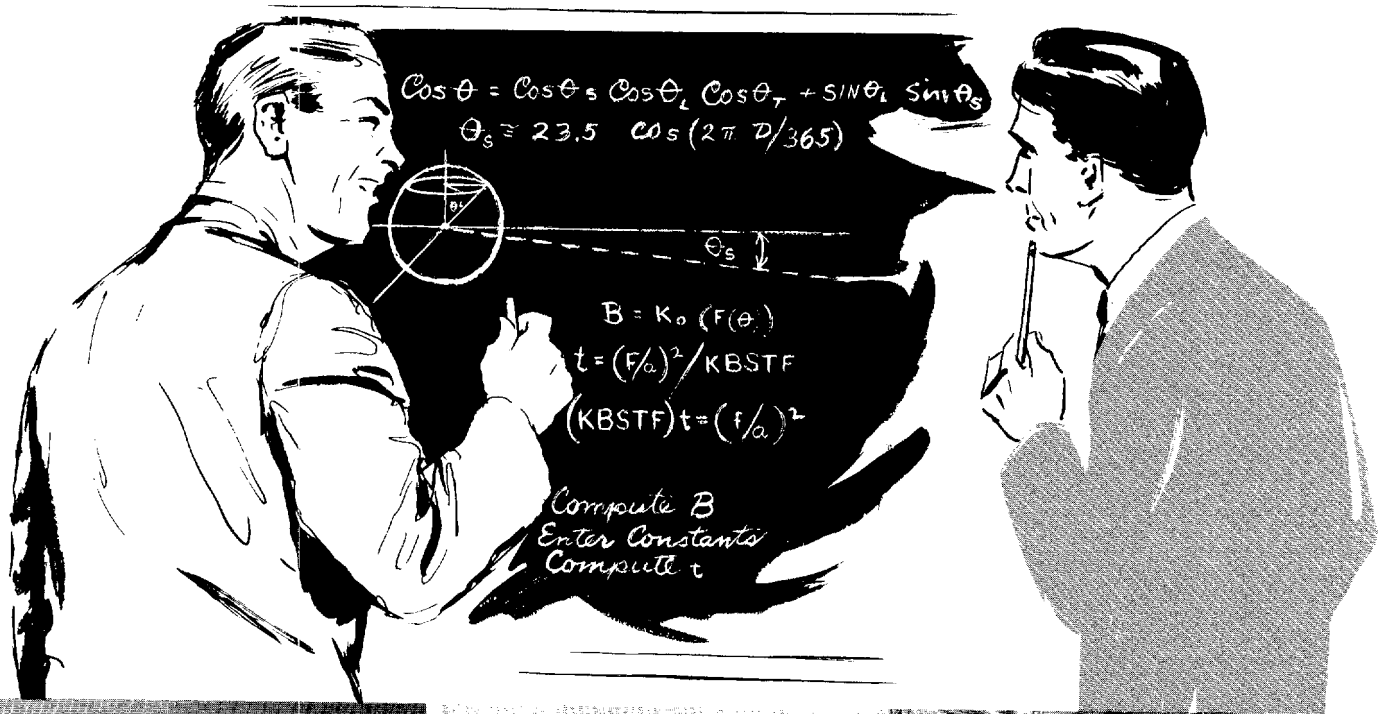

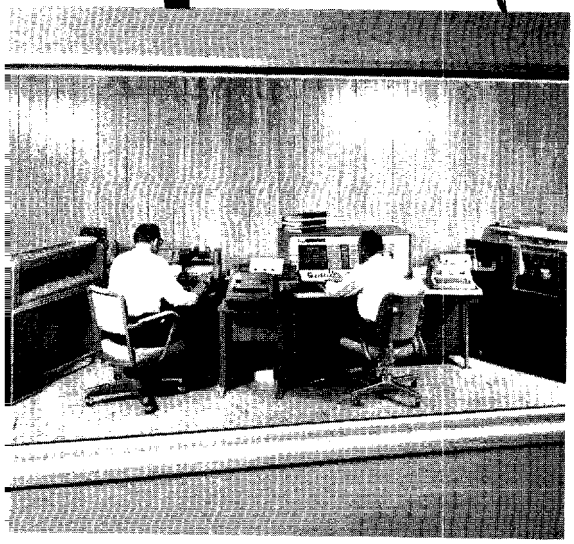

Systems Analysis

The Applied Research Department is equipped with an IBM 1620 digital computer and a [redacted] GEDA L-2 analog computer for systems analysis projects. A highly trained staff of senior engineers are available to develop mathematical models of systems, design programs and analyze requirements in the fields of reconnaissance, guidance and control, and space systems instrumentation.

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Photometric Standards

[redacted] engineers have wide experience in development of specialized primary and secondary standards, including master resolution targets, density standards, measurement standards and special instrumentation involving measurement of light intensity and color temperature.

Optical Laboratories

The Test and Evaluation Department optical laboratories are equipped with a 120-inch Collimator, light and color temperature measurement standards, an integrating sphere and complete accessory instrumentation for work in optics, laser applications, infrared and general photographic and photometric projects.

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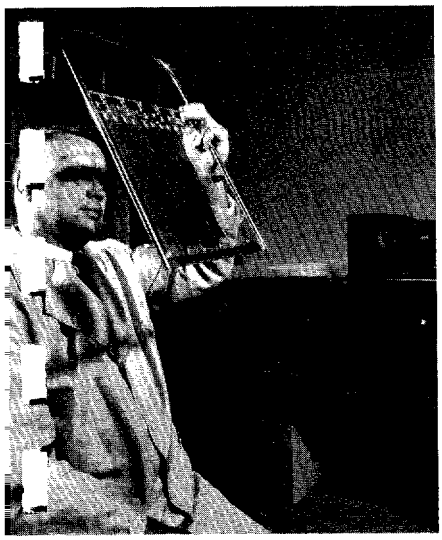
THE ENGINEERS and SCIENTISTS of [redacted] are dedicated to applying the full resources of modern science and technology to advance the state-of-the-art in the fields of reconnaissance and intelligence systems, guidance and control equipment and space systems instrumentation. They are unhindered by production problems, completely free in their choice of equipment and qualified to provide objective technical leadership.

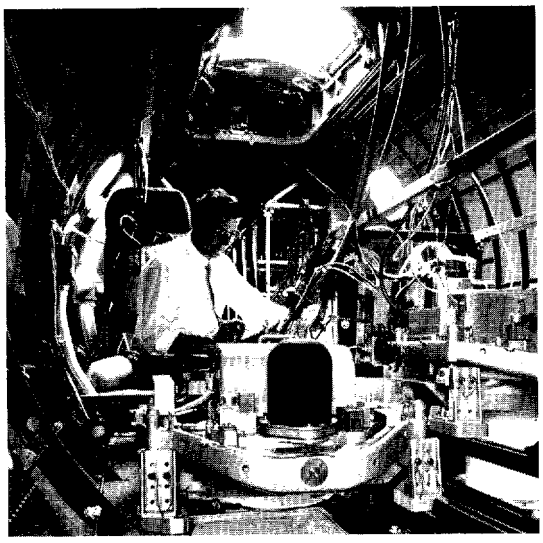
[redacted] has purposely refrained from production activity, in order to maintain its position of objectivity and to assure the rendition or exercise of unbiased judgment.

Our engineering staff represents a cross section of the technologies required in these complex fields. It includes mechanical, electrical and electronic engineers and designers, theoretical physicists, photographic scientists, logical systems designers, applied mathematicians, computer programmers and photo interpreters. These are seasoned men with heavy experience in their specialties.

Organized exclusively to work in these fields:

- Applied Research and Development
- Theoretical and Experimental Research
- Advanced Systems Analysis and Planning
- Test and Evaluation





Photographic Science

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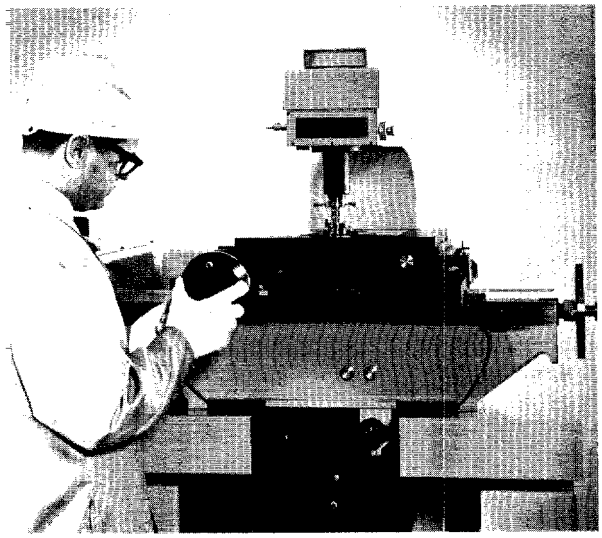
Four laboratories are used for applied research and application engineering in sensitized materials. Equipment includes an [redacted] lb sensitometer, sensitometric processors, densitometers, a recording microdensitometer, a resolution sensitometer, automatic continuous processors, automatic printers and complete accessory equipment.

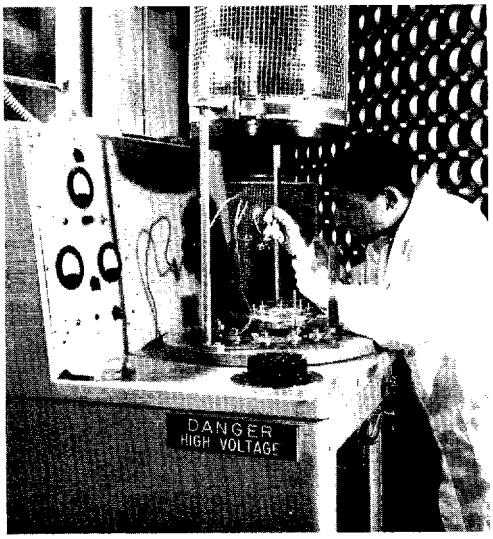
Flight Test

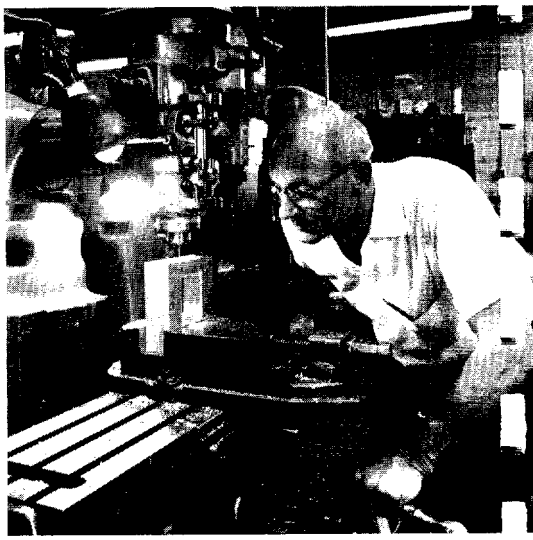
The Systems Engineering Department is equipped to plan and carry out complete intelligence subsystem design and flight test programs, including the design and fabrication of electrical and electronic instrumentation and special mounts, modification of aircraft, flight testing and processing and analysis of flight test data.

Systems Engineering

The senior engineering staff is uniquely qualified by long experience in their various fields to serve as technical program managers in the development of aerial reconnaissance and intelligence devices. Their accomplishments include technical management of airborne subsystem development projects and supporting ground systems.







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Instrumentation Design

[redacted] engineers have specialized in the design of highly accurate and complex electro-optical instruments, including micro-densitometers, high altitude scanners, spatial frequency sensors and photographic recording equipment.

Vacuum Plating Equipment

The laboratory is equipped to produce special mirrors, prisms, lens coatings, neutral density filters and similar products requiring the utilization of metal evaporation techniques.

Model Shop Facilities

The engineering laboratory includes a complete model shop, equipped with horizontal and vertical milling machines, shapers, engine lathes, second operation lathes, grinders, sheet metal forming equipment, welding and brazing equipment and heat treating facilities.

STATINTL

CLEAN ROOM FACILITIES

In keeping with [redacted] continuing effort to maintain the ultimate in reconnaissance test and evaluation equipment, our facilities include six [redacted] (considered superior to Class 4) clean rooms containing 520 cubic feet of working space. These rooms remove 99.97 percent of all particles larger than 0.3 microns. Two of these rooms contain photosensitive processing equipment, and all rooms are capable of total dark operation. The rooms are equipped with associated measuring standards and equipment in the micro region. An additional 440 square feet of Class 2 area is available for more routine clean activities.

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With the addition of these clean room facilities, [redacted] is in a position to provide its customers with the finest environmental control available for applied research and testing problems.

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[redacted]

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[redacted]

Litho in U.S.A.

The data set forth herein is submitted as an unsolicited proposal and shall not be disclosed outside the Government or be duplicated, used or disclosed in whole or in part for any purpose other than to evaluate the proposal; provided, that if a contract is awarded to this offeror as a result of or in connection with the submission of such data, the Government shall have the right to duplicate, use, or disclose this data to the extent provided in the contract. This restriction does not limit the Government's right to use information contained in such data if it is obtained from another source.

STATINTL

Approved For Release 2003/08/04 : CIA-RDP78B04747A001200030001-5

STATINTL

March 19, 1964

STATINTL

P. O. Box 2831
Washington 13, D. C.

Dear Sir:

Reference is made to our proposal entitled "Special Targets for Interpretation Equipment Evaluation" which was submitted under cover of our letter dated 6 March 1964. Our proposal will result in the delivery of 3 each 1040 line target mounted on glass and 3 each 1040 line targets mounted on film. I regret the inadvertant omission of this information from our previous submission.

I am also including a breakdown of our estimate of [redacted] for your information and use. STATINTL

Sincerely yours,

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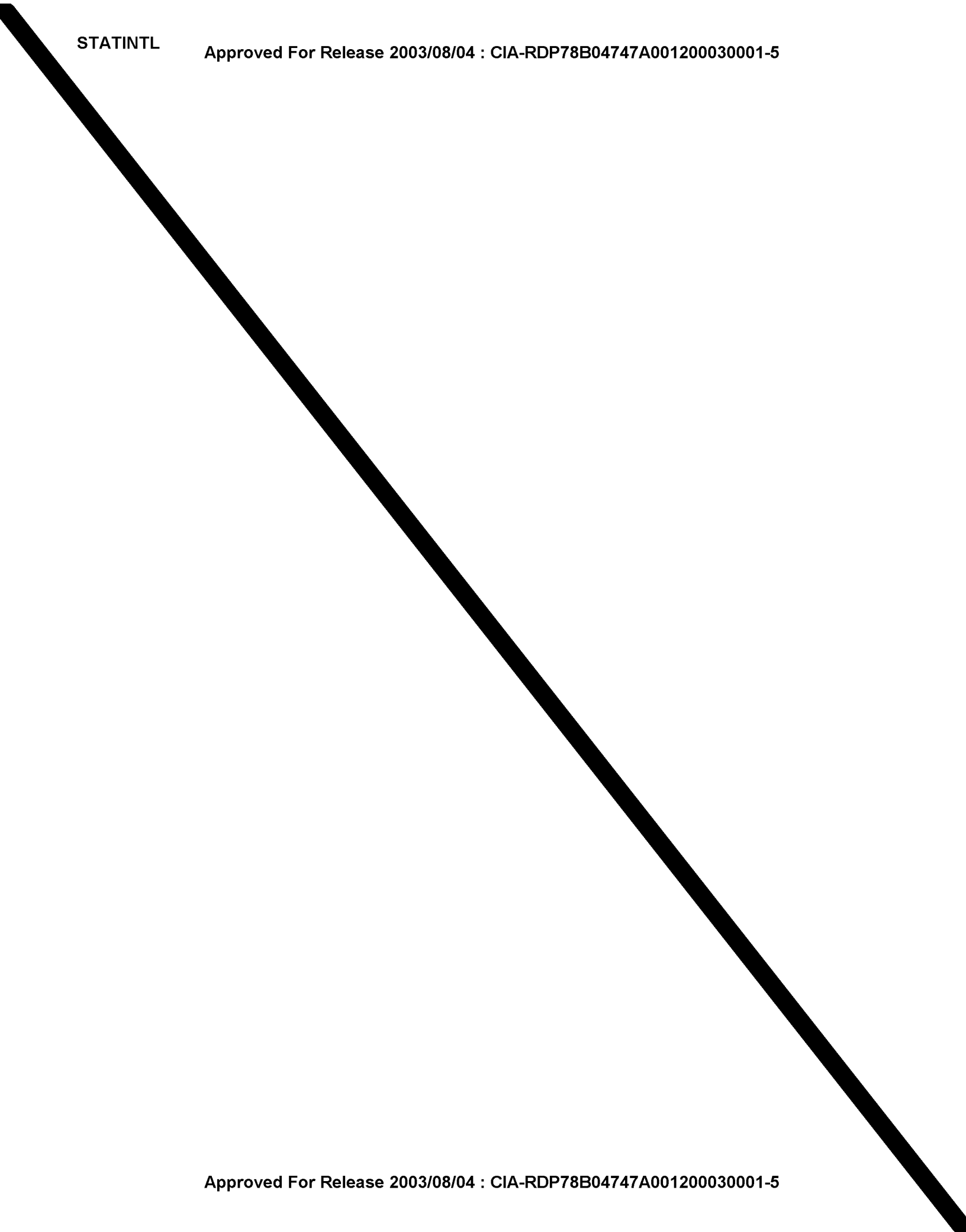

Approved For Release 2003/08/04 : CIA-RDP78B04747A001200030001-5

STATEMENT OF WORK

SPECIAL TARGETS FOR INTERPRETATION EQUIPMENT EVALUATION

A. SCOPE

This Statement of Work covers services to be performed and material to be supplied in support of research and experimentation with standards for calibration and evaluation of micro-densitometers, microanalyzers, viewers, and related equipment used in photographic image evaluation. The objective of this program is to determine methods and techniques to upgrade present existing standards to a higher order of performance, that appears achievable within the time period of this program. A broad research and development program should have the following objectives as an aim point:

1. Resolution targets to 1040 lines per millimeter.

B. REQUIREMENTS

The contractor shall supply a minimum of 4000 hours of research and development effort to perform the requirements listed herein. The contractor's technical personnel may be required to perform travel to various Government installations or manufacturers' plants within the continental limits of the United States to coordinate information on the experimental research program.

1. In an effort to upgrade the resolution targets, the contractor shall perform research and development in the area of projection lenses, materials, and exposure techniques for fabricating targets. The contractor will investigate to

determine the best commercially available emulsions in addition to investigating the possibility of producing light sensitive coatings not limited by present-day techniques. Research and development shall be performed by the contractor in the areas of focusing accuracy, positional holding techniques, vibration problems, and environmental condition.

2. The contractor shall supply within twelve months after receipt of contract the following standards fabricated by utilizing the upgraded state-of-the-art procedures developed during this R & D effort. Twelve sets of resolution standards with complete calibration.

C. REPORTS

The contractor shall submit monthly status reports briefly outlining the results achieved on the experimental research program. A technical report outlining the results achieved in upgrading the present standards and significant results achieved on this R & D program will be submitted at the completion of this contract.

D. PERIOD OF PERFORMANCE

A twelve-month R & D effort is anticipated for this program.

E. FACILITIES

The contractor shall have available in-house the following research facilities capable of performing the required services.

1. Sensitometric test equipment consisting of a minimum of an [redacted] STAT Ib sensitometer, a sensitometric processor capable of maintaining processing control to $\pm 0.1^{\circ}F$.

2. Density and measurement instrumentation consisting of a recording micro-densitometer, measuring microscopes, and necessary calibration standards.

3. National Bureau of Standards light standards, light intensity measurement equipment, and integrating sphere for making absolute density measurement.

4. A vacuum coating machine utilizing electron beam bombardment and proper clean room facilities for utilization of this equipment.

5. A special step and repeat device to permit accurately positioning and holding the various standard targets for printing as required.

6. The required flat field optical objectives, both for white light and ultraviolet type light sources.

7. Scanning microanalyzer with positional readout accuracy to .2 micron.

STATINTL

March 4, 1964

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P.O. Box 2831
Washington 13, D. C.

STATINTL

We are pleased to submit the following prices for 260 and 520 line targets mounted on film and on glass for your consideration.

(1) Three (3) each 260 line "T" Resolution Target mounted on glass at a unit price of each and a total price STAT STAT STAT

(2) Three (3) each 260 line "T" Resolution Target mounted on film at a unit price of each and a total price STAT STAT STAT

(3) Six (6) each 520 line "T" Resolution Target mounted on glass at a unit price of each and a total price of STAT STAT STAT

(4) Six (6) each 520 line "T" Resolution Target mounted on film at a unit price of each and a total price of STAT STAT STAT

These items can be delivered as follows:

Items 1 and 2 within 90 days after receipt of order.

Items 3 and 4 within 180 days after receipt of order.

The foregoing prices are submitted on a straight fixed price basis and contemplate:

Packaging and Packing: Best commercial level.
FOB: Postpaid.

Shipment: Via Air Parcel Post.
Terms: Net 30 days.

The terms and conditions normally attendant to a unilateral fixed price purchase order are acceptable to us.

I hope this meets all of your requirements. If you have any questions, please contact the undersigned.

Sincerely,

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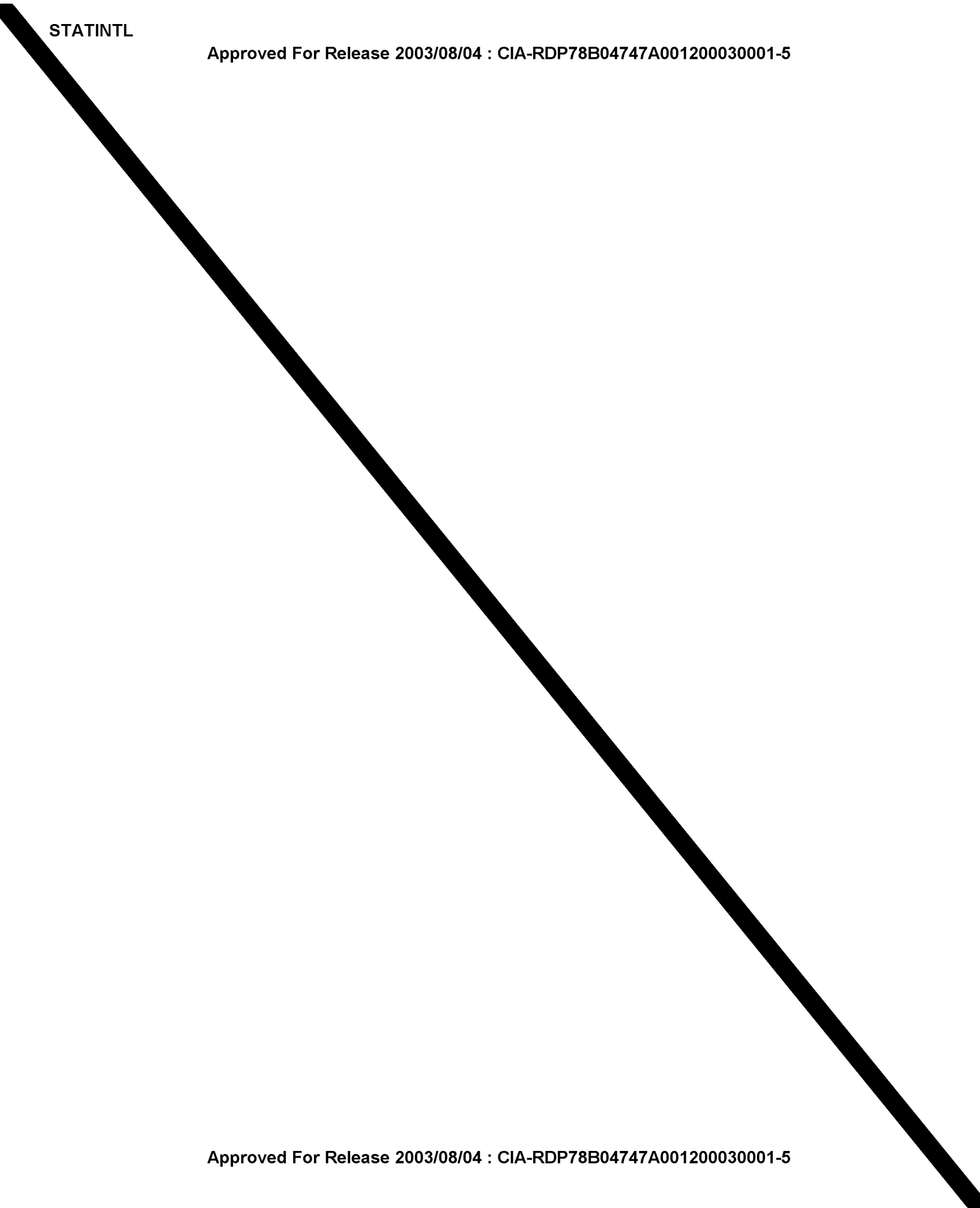

DCI. BR. File

25X1 [redacted]

16 Mar

Route before filing

12 March 1964

MEMORANDUM FOR: Assistant for Administration, NPIC

ATTENTION : Chief, Logistics Branch, NPIC

THROUGH : Assistant for Plans and Development, NPIC

SUBJECT : Procurement of Special Resolution Targets

1. The attached requisition #5500-2726-64 covers the procurement of special resolution targets from [redacted] The price and delivery schedule for these are quoted in the [redacted] letter of 4 March 1964. A copy of which is forwarded with this memorandum.

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2. These items represent the limit of the state of technology in resolution target production. No other source for such reliably precise targets in excess of 228 l/mm is currently known. These targets will be used by the EDL Branch for investigations into lens and film resolution capabilities, and by the Development Branch in the field evaluation of viewers and related optical equipment.

25X1

[redacted]

Chief, Exploratory Development Laboratory
NPIC

Attachment
1.Requisition #5500-2726-64
2.Memo from [redacted]

25X1